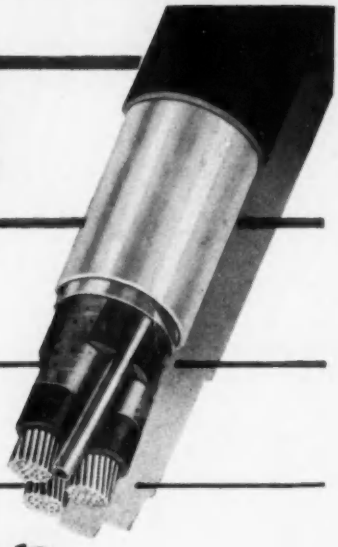
ELECTRICAL TIMES

THURSDAY

31 SEPT 1953

SIXPENCE

ALUMINIUM SHEATHED IMPREGNATED PRESSURE CABLES FOR 33kV



BICC have now designed a 33kV 3-core Aluminium Sheathed Impregnated Pressure Cable which is lighter, cheaper, and smaller than the conventional lead sheathed type.

It is economical because the mechanical strength of the aluminium sheath is capable of withstanding the internal gas pressure of 200 lb. per square inch without reinforcement.

BICC are the first to produce a high voltage cable of this type.

For further information send for our publication No. 281W.

B.I. Callender's

BRITISH INSULATED CALLENDER'S CABLES LIMITED
NORFOLK HOUSE, NORFOLK STREET, LONDON, W.C.2

A NEW ACE *in the Dealer's Hand*

A smart modern reflector fire, built for the discerning buyer, yet priced for the massed market . . . that is the ace we have up our sleeve for the coming season. Make your bid for business by placing your order now !

Model No.: F.103.

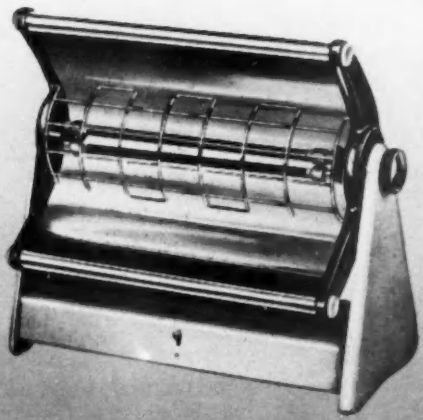
Colour: Cream and Black.

Loading: 2 kW.

Voltage ranges: 200/210, 220/230, 240/250.

Dimensions: 18in. wide by 16½in. high by 10 in. deep.

List Price: £5.10.0.
Purchase Tax £4.0.10½.



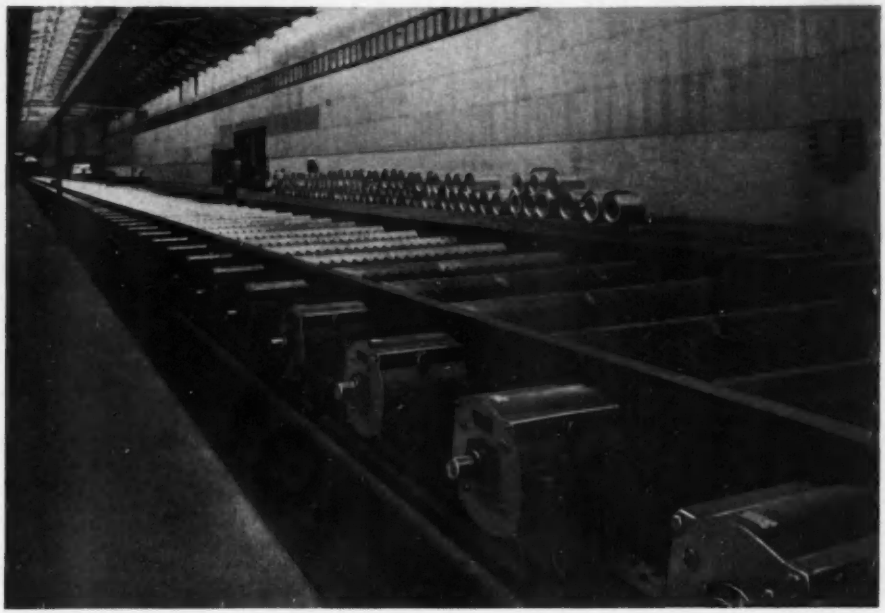
Please write for leaflet FE5, which gives full details.

A BNE Product

BRITISH NATIONAL ELECTRICS LTD.

The Domestic Appliances Section of JOHNSON & PHILLIPS LTD.

NEWARTHILL · MOTHERWELL · SCOTLAND.



More than 250 L.S.E. MOTORS
at ROGERSTONE MILL

The great new Continuous Strip Mill of the Northern Aluminium Co., Ltd., is equipped with more than 250 L.S.E. motors, including:—

245 Roller Table Motors, floating type, totally enclosed squirrel cage, 350/57 r.p.m., 95/21 volts, 37/8 cycles.

Up-Coiler Motor, "N-S" variable speed, Emcol totally enclosed, 150/32 h.p., 1,240/170 r.p.m.

Edge-Trimmer motor, "N-S" variable speed, Emcol totally enclosed, 100/19 h.p., 1,240/170 r.p.m.

5 "Speedmaster" equipments, each 130 k.VA at 95/21 volts, 37/8 cycles, for supply to the above motors. (These are single-unit variable voltage frequency converters.)

(Further details of this unique installation will be available shortly to engineers interested in synchronised variable speed drives.)

From the comprehensive range of machines made by the specialists:

LAURENCE, SCOTT
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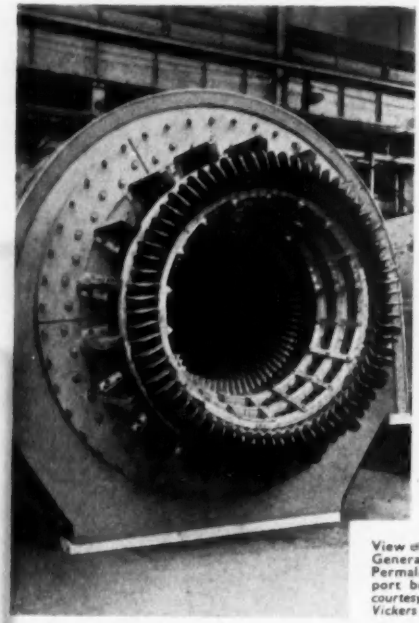

View of completed Turbo Generator Stator showing Permali end winding support brackets. *Photo by courtesy of Metropolitan Vickers Electric Co. Ltd.*

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STRENGTH

is vital . . .

INSULATE WITH

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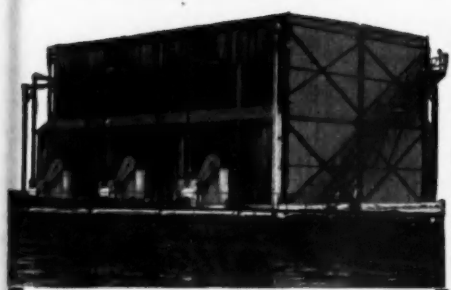
Laminated · Impregnated · Densified

THE NEW INSULATION CO., LTD., GLOUCESTER · TELEPHONE 24941 · TELEGRAMS 'NICO' GLOUCESTER 17586A



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are being used in all parts of the world under widely varying conditions and giving entire satisfaction. Their special design and construction makes them the most efficient tower of the present day.

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PREMIER COOLER & ENGINEERING CO., LTD.
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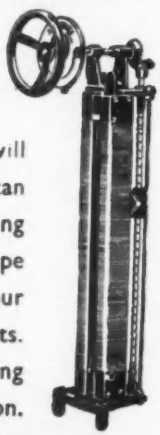
for all purposes



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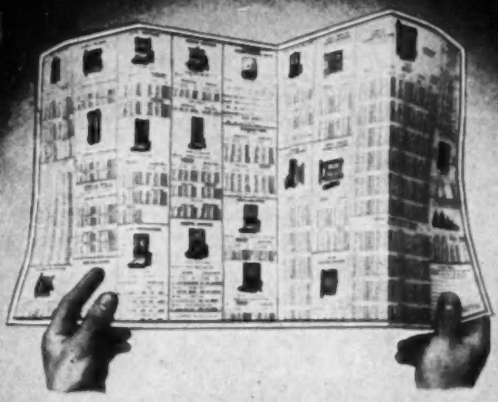
Telephone: ASTon Cross 2666 (3 lines). Telegrams: OHMIC, BIRMINGHAM



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1912

1950

Interior of our Showroom 1932

The Story of BELLING *& Company Ltd.* No. 13

This time I am going to talk about our "sales side." Mr. Hawkins, our present Sales Manager, joined us in 1919. He was in the Works for a while, then went over to France to look into the possibility of starting a small works over there as our business with that country was being gradually closed down due to import duties. However, eventually we decided not to take a Works ourselves but to help our then French agent to start up in a small way on his own.

On his return Mr. Hawkins then commenced to take over the sales side generally, and his first scheme was that of dividing the British Isles up into nine or ten separate areas, and having a depot in each area with a showroom of our own in Regent Street. This scheme worked quite well for some five or six years, but eventually it was superseded by our present system which is to have our own representatives spread over the country.

Talking about sales generally, I think, following on the period when I did most of the travelling personally, Mr. Doyle was really our first outside representative and he travelled the whole country. Mr. Hawkins, of course, also did a lot of travelling in the early days.

At this time, that is 1932, we were already doing quite a good Export Trade, and we did considerable sales in the following countries and towns—Australia, New Zealand, South Africa, Malta, Holland, India, Hong Kong, Colombo, Afghanistan, Basra, France, Singapore, Shanghai, Canada, Montevideo, Buenos Aires, Rio de Janeiro. I remember we used to have a very friendly agent from Afghanistan called Abdul Hamid Abdul Aziz who used to come over each year. The first year he could speak scarcely a word of English. By the third year he was very nearly perfect. The goods we sold him we had to pack in small lots suitable for camel transport over the passes into his country.

The above I think gives a broad view of our sales arrangements at that time. Incidentally, our sales were always far ahead of our production, and the same applies today.

Looking up the staff records of this period, I find that Mr. Brunton, who is now our Research Manager, joined us in 1928, first of all being in charge of our Drawing Office. After a year or two, he was then put in charge of our Research and Design Departments, which he has controlled ever since.

I also see Mr. Aston, who is our Chartered Accountant, joined us in 1929, and still looks after this end of our business. Very shortly after joining he installed the latest electric book-keeping machines in our Sales Ledger Department, which have been an unqualified success.

In this same year, 1932, I find that I commenced giving all our employees a week's holiday with pay. Here again, as with our canteen, we were far in advance of the times on looking after the well-being of our employees. This week's holiday with pay was kept going right away through, until such time as it became part of the law of the country.

In this same year I must mention we added five more bays to our west building, and patents were in connection with our boiler grillers.

The next chapter tells, amongst other things, of how I joined in with three other very interesting concerns.

C. R. Belling.

Belling & Co., Ltd., Bridge Works, Enfield, Middx. Tel.: Howard 1212.

CRC13

The New

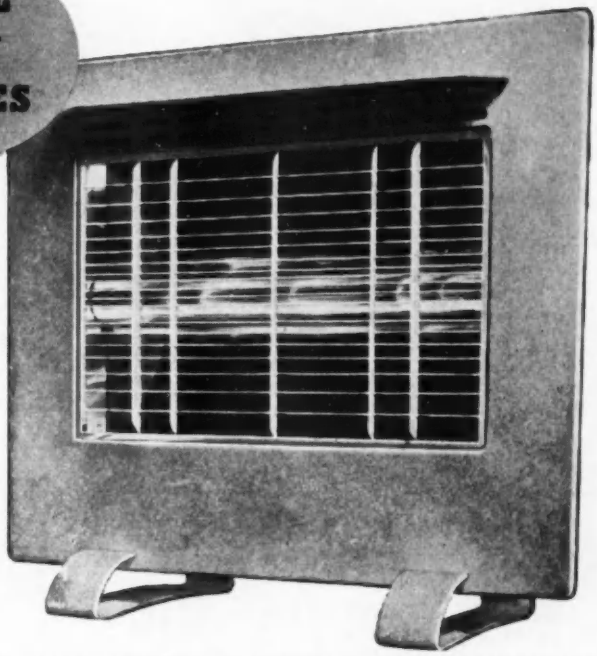
FERRANTI

Radiant "SAFERA" *Fire*

The well known and proved advantages of Radiant Heating, as pioneered by Ferranti Ltd., are combined in this new Fire with a degree of safety never hitherto attained in any form of Radiant Fire

PRICE: PORTABLE MODEL F.S. 7250 OR PANEL MODEL F.S. 7150 £13 17S. 7D. (INC. £5 17S. 7D. TAX)

SPECIAL SAFETY FEATURES



Graduated Guard

Element Shield

Current switched off if moved from normal position

Shock Absorbing Feet

Element Contact Arms entirely protected by Ceramic Shields

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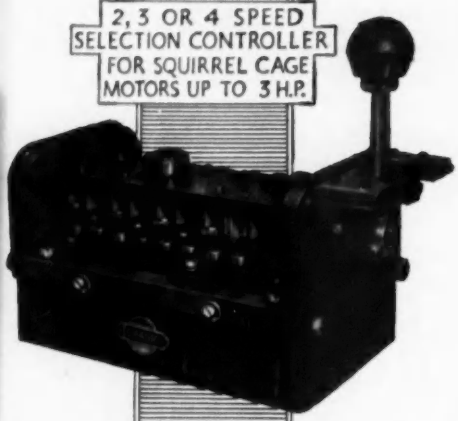
FERRANTI LTD., MOSTON, MANCHESTER 10, AND 36 KINGSWAY, LONDON, W.C.2

'IGRANIC'

Electric Control Gear



This switch — Catalogue No. 85265 — is designed for the starting and speed control of two-, three-, or four-speed squirrel cage motors up to 3 h.p. 230/550 V. It is also suitable for larger motors up to 7½ h.p., 340/550 V if used in conjunction with a suitable starter.

It is especially suitable for the control of electrically driven machine tools or other machines involving multi-speed drives ; typical applications being drill spindles, milling cutters and lathe head stocks.

Full particulars given on Publication 85265Z1 available on request to Publicity Department, Bedford.

One of a large range of ***STANDARD*** *Igranic Auxiliary Switches that are* ***SPECIALLY*** *engineered throughout.*

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Electric
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Domestic and Industrial

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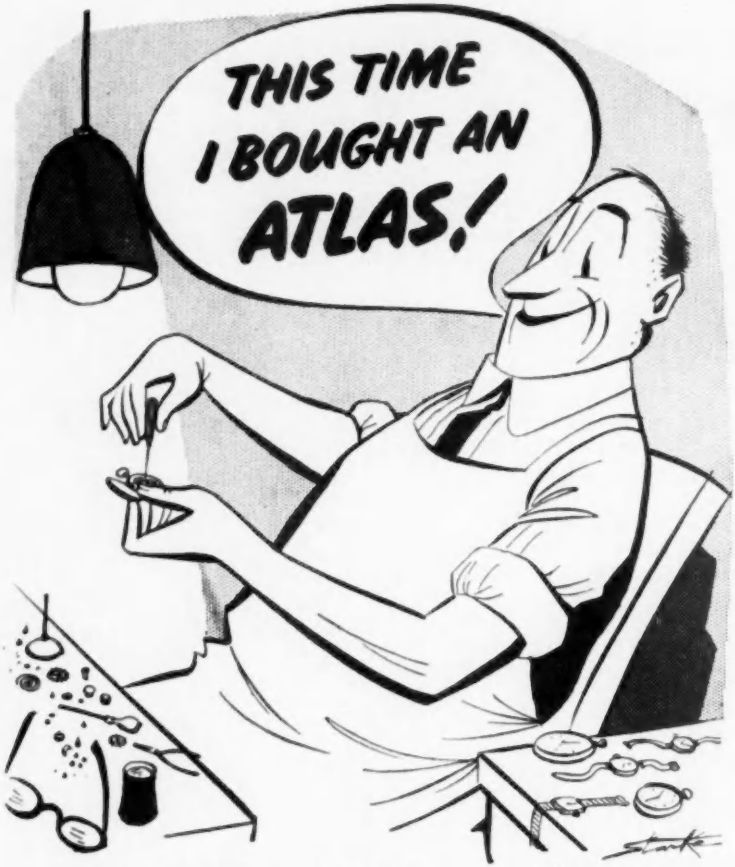

You're going to like the new ATLAS lamp advertising! Warm, friendly drawings by a well known artist will put people into the right humour for ATLAS lamp buying.

Will you back up our effort? We have new display material to help you make this your "biggest ever" lamp season.

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If you want the best switches *and* the best value for money, you want MEM. Try a sample dozen and see for yourself. The designs are neat and robust. Every part is beautifully made because MEM make every part themselves—even the porcelains. Mass precision production is the reason for the excellent value. And you can get quick delivery.

Send for List No. 302 for details of the range—one and two way, 5 amps 250 volts, surface and semi-recessed and flush mounting—also flush plates and wood and iron boxes.

Makers of Switch, fuse and motor control gear, electric fires and localised lighting equipment.

MIDLAND ELECTRIC MANUFACTURING CO. LTD · TYSELEY · BIRMINGHAM. 11

Branches in London and Manchester

Contractors for every class of building and civil engineering work at home and overseas

LAING

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ELECTRIC CONSTRUCTION BOOSTS GAS AT BIRMINGHAM

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WEST MIDLANDS GAS BOARD
J. E. WAKEFORD, Esq.
M.B.E., M.Inst.Gas E., M.Inst.F.
Divisional Manager.

This Electric Construction motor driving a booster at the Washwood Heath plant of the West Midland Gas Board (Birmingham District) is a 460 B.H.P. fully compensated D.C. machine with a speed range of 750/1750 R.P.M. It is pressure-ventilated from separate motor-driven fans.

The control gear for this motor and the rectifier which supplies it are of E.C.C. make.

THE ELECTRIC CONSTRUCTION Co LTD
WOLVERHAMPTON
Telephone 21455 (7 lines)

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TECHNIQUE *for laying*

J.&P. SEAMLESS

ALUMINIUM

BRITISH PATENT NOS. 627815 & 627793

SHEATHED CABLES

... IN TRENCHES

The inherent tensile strength of aluminium permits J. & P. Aluminium Sheathed Cables to be laid in open trenches by a simple method which frequently offers a saving in labour.

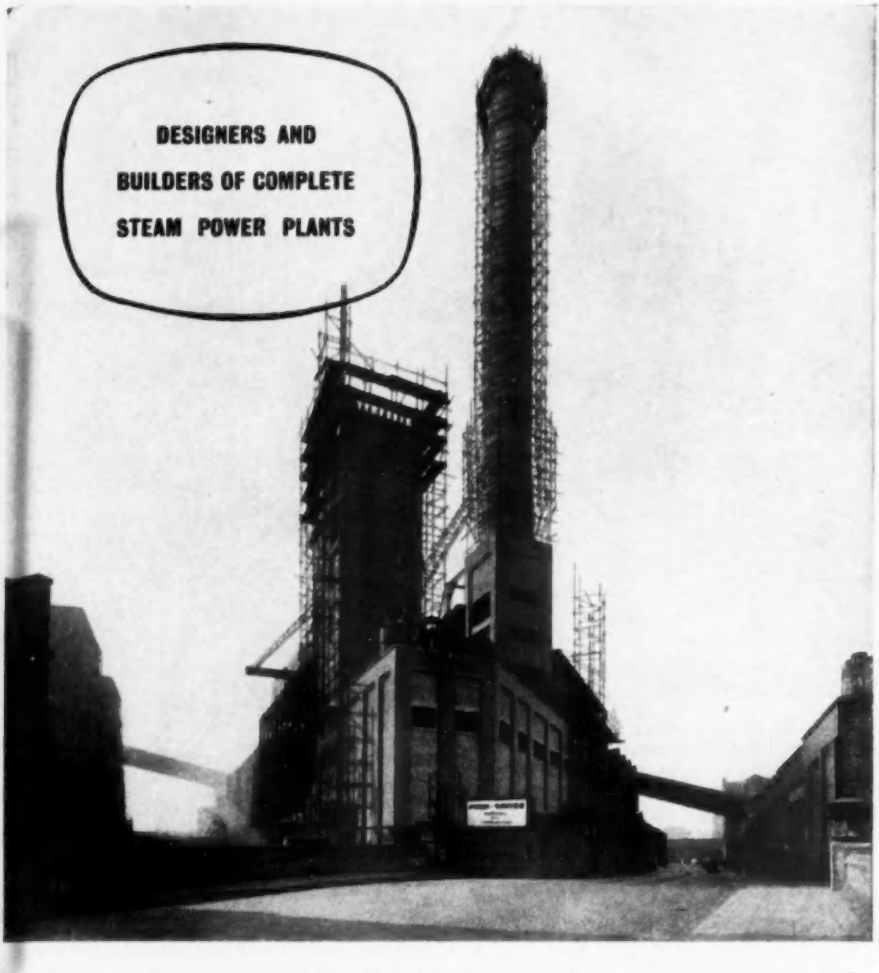
The recommended procedure is to place cable rollers in the trench at intervals of eight feet or more, those around bends in the trench being placed on their sides. Adjacent to the first few rollers, bars or picket pins should be driven into the trench bottom in pairs close up to the cable to act as guides. A draw rope is attached to the end of the cable by means of a cable stocking and the cable drawn straight off the drum into the trench by hand haulage on the rope or by a winch if available. An improvised brake consisting of a plank of timber should be used to apply some friction to a flange of the drum. It is unnecessary to handle the cable directly during the running-out process, and in fact this should be avoided. It will be found that the cable will lie quite straight in the trench.

By the method outlined a small labour force is able to lay very large aluminium sheathed cables.

JOHNSON & PHILLIPS LTD.

CHARLTON LONDON S.E.7

The mark that means that "little more" in quality



Simon-Carves provide a comprehensive service in the design and construction of large water-tube boiler installations and complete power stations, embracing foundations, buildings, steam generation, coal, ash and dust handling, electrical and civil engineering.

TATE & LYLE LTD. LIVERPOOL

The photograph shows a typical contract nearing completion for Messrs. Tate and Lyle Ltd. in Liverpool. This contract includes the demolition of existing buildings; excavations for reinforced concrete foundations, and the design and construction of a steel-framed brick-filled building and reinforced concrete chimney; pneumatic coal intake plant and four stoker-fired boilers each generating 72,000 lbs. of steam per hour at 650 lbs. per sq in. and 750° F; ash handling plant, water treatment plant, space heating equipment, electric motors and starters, cabling and wiring.

Steam power by ***Simon-Carves Ltd*** SIMON ENGINEERING GROUP

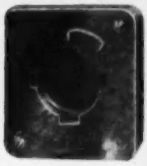
STOCKPORT ENGLAND

475,157 CONNECTORS

SANDERS CLOCK

Where all these are used and who uses them is a question we are not competent to answer, but we do know that our Authorised Distributors require substantial stocks to meet the daily demand, Sanders Clock Connectors being called for almost exclusively. The reasons for their popularity are not far to seek, for the exclusive patented design combining such ease of wiring and functional efficiency within so neat and compact a compass, provides everything required in an accessory of this nature.

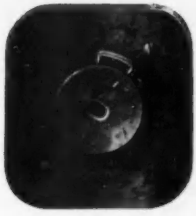
Complete Unit showing plug when in contact locked in position

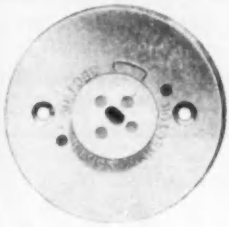


Plug removed showing complete shrouding of live contacts

Non-Reversible Cover removed showing ease of wiring. An abundance of knockouts are provided.

Plug showing location of 2 amp. BS.646 fuse. Wiring and effective cord grip are simplicity itself.





Comprehensive stocks are carried by selected wholesalers in all large centres of population.

List No.	Description	Approximate Dimensions	List Price
TA/OF 22	Square, surface (Walnut)	1⅝" x 2¼" x ⅝" projection	per doz. *26/4
KD/OF 22	Square, flush (Walnut)	2⅜" x 2¼" x ¼" projection	*29/4
BKD/OF 22	Circular, sunk for use with standard BS.31 or BS.820 boxes (White)	3½" diam. x ¼" projection	*32/–

*Plus 110% advance

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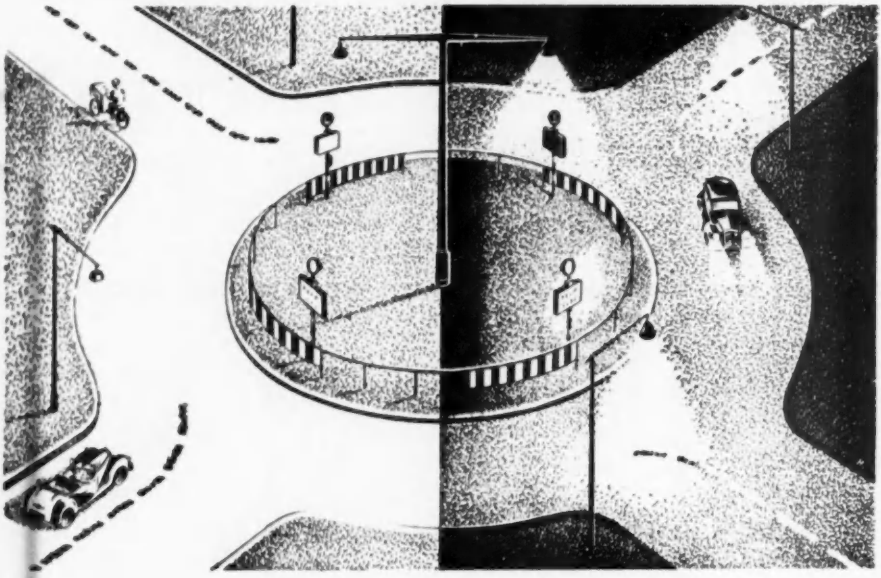
WM. SANDERS & CO. (WEDNESBURY) LTD., WEDNESBURY, STAFFS.

A NEW DEVELOPMENT IN AUTOMATIC LIGHTING CONTROL



● MAGNETIC AMPLIFIER—HAS NO VALVES ● NEVER NEEDS ADJUSTING OR RE-SETTING ● REDUCED MAINTENANCE COST

Elliott photo-electric switching cuts the labour cost of street lighting—lights up whenever daylight fails, in good time, every time. Absolutely reliable, even after supply cuts, and needs no attention. Outstanding features include sealed barrier-layer photo-cell and robust, weatherproof magnetic amplifier.

Low impedance circuit puts no limit to distance from cell to control unit and simplifies installation. Mercury switch eliminates contact troubles. Switching capacity 2 KVA.

Extended field tests have proved the value of the Elliott Controller, especially for traffic signs on isolated sites. Automatic illumination in fog or dark conditions is a vital safety measure.

ELLIOTT

AUTOMATIC LIGHTING CONTROLLER

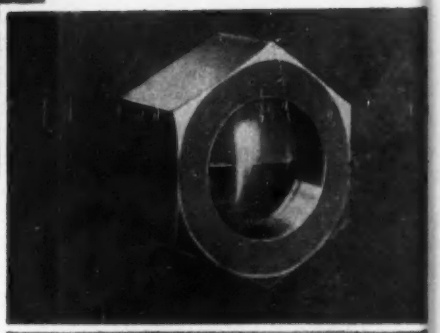
Ask for publication G033A

ELLIOTT BROTHERS (LONDON) LTD., CENTURY WORKS, LEWISHAM, LONDON, S.E.13

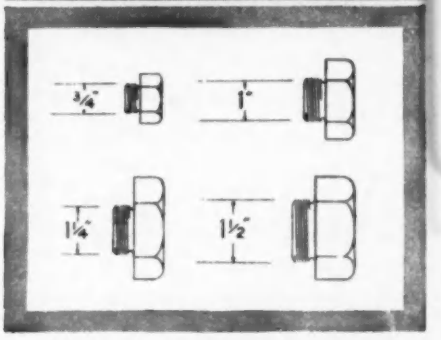
B T-H

'WINDONUT'

Glass-steel inspection window



The BTH *Windonut* provides a peep-hole through a mild-steel wall, a most convenient form of inspection window for oil-level indication and similar applications, at a very low cost. The special glass used was developed by BTH, and is fusion-sealed into the steel nut with which it forms an integral part. The *Windonut* is easily installed—virtually unbreakable—neat in appearance—available in four sizes, for ¾", 1", 1¼", and 1½" B.S.P. thread



BRITISH THOMSON-HOUSTON

THE BRITISH THOMSON-HOUSTON CO., LTD., RUGBY, ENGLAND

A3911

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MANUFACTURERS OF THE FOLLOWING CABLES:

V.I.R. Taped, Braided and Compounded.
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V.I.R. and Armoured.
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P.V.C. Insulated, Braided and Compounded.
P.V.C. Insulated and Sheathed.
P.V.C. Flexibles.
T.R.S. Flexibles.
Cotton and Silk Flexibles.
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THE GENERAL CABLE MANUFACTURING CO., LTD.

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Talking about
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The Jackson Cooker is such a first class engineering job that it demands absolutely minimum attention where maintenance is concerned. In several areas there are many " 20 Series " Models — made in 1922 — still on circuit. — Think of it, 27 years of daily service! In 1939, of all cookers sold, over 40% were Jackson. To-day, as always, the Jackson ' Cleanline ' series still serves the engineer faithfully. The solid cast iron and heavy gauge steel construction — the design of the oven and elements which permits an amazing food capacity for an oven of its size — the quality of the vitreous enamel, which is second to none — all combine to make a Jackson the obvious choice for Hire and Hire Purchase Schemes. Low in maintenance cost — low in fuel consumption and thoroughly perfect in cooking. Ask any Maintenance Engineer who has thousands to look after and you will learn why Jackson have made and ***sold over half a million cookers.*** *Supplied in three attractive colours, mottled grey, mottled green and two tone ivory. The ' Cleanline ' series complies with E.D.A. interchangeability and specifications.*

THE JACKSON ELECTRIC STOVE CO., LTD.
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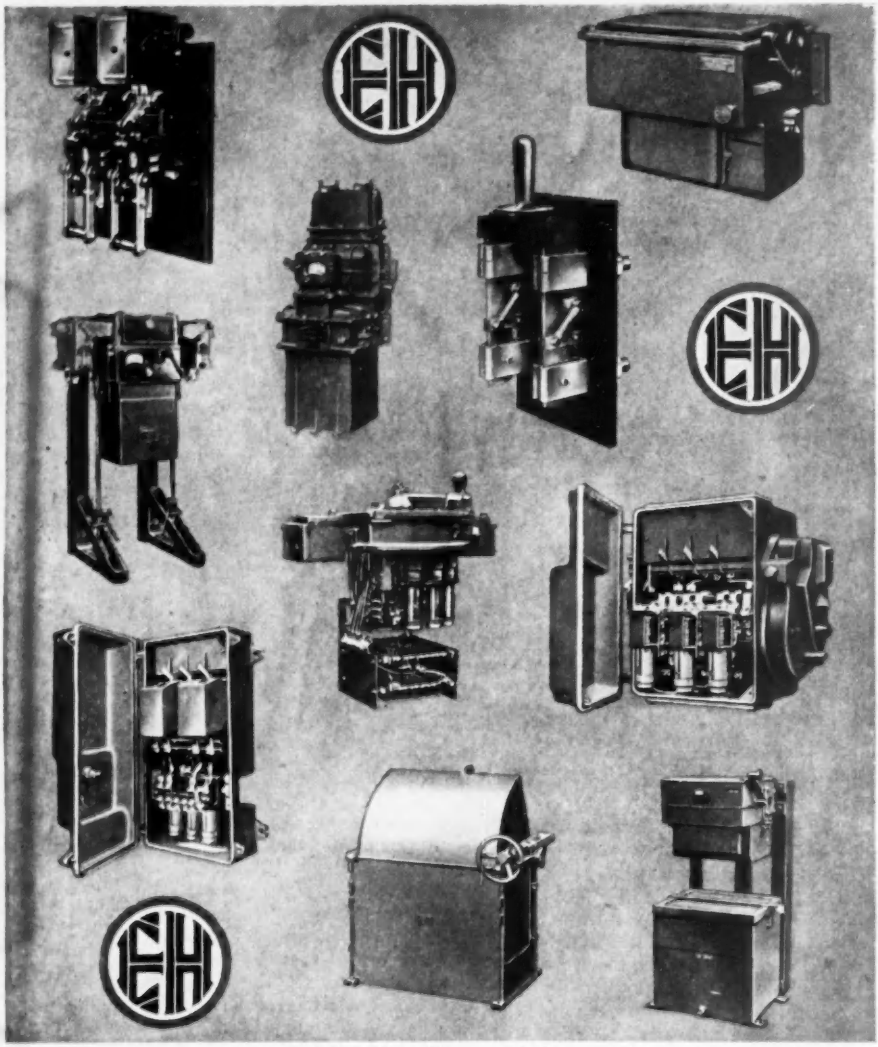
"It's the Gear ENGINEERS LIKE TO 'LIVE' WITH"



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535(A)

TELCON

CELEBRATES ITS

CENTENARY

1850 – 1950

1950 marks the anniversary of 100 years of manufacturing enterprise since the formation of The Gutta Percha Company, which in 1850 made the first submarine telegraph cable laid between England and France and which became the nucleus of The Telegraph Construction and Maintenance Company Ltd. From this small beginning as merchant adventurers in a new commodity, grew the Telcon organisation, whose activities have steadily multiplied until today they cover a wide field of industry.

TELCON CABLES	Power distribution cables; land communication cables; radio frequency and television cables; instrument wires; etc.
TELCON METALS	Magnetic alloys; glass sealing alloys; resistance alloys; thermostatic bimetals; beryllium copper; etc.
TELCON PLASTICS	Gutta Percha and Telcothene: sheet, tube, mouldings, tape, coated papers, etc.

The Telegraph Construction & Maintenance Co. Ltd
Telcon Works Greenwich, S.E.10
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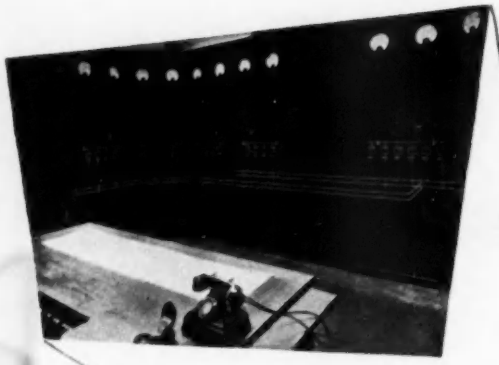
TELCON



one pair of wires - - -

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one pair of eyes - - -

An electric railway connects Liverpool with the Wirral Peninsula. Electricity is fed through six rectifier sub-stations, involving 51 circuit breakers and the whole of the equipment is controlled by "A.T.M." SUPERVISORY REMOTE INDICATION and CONTROL EQUIPMENT operated from a central control room at BIRKENHEAD.

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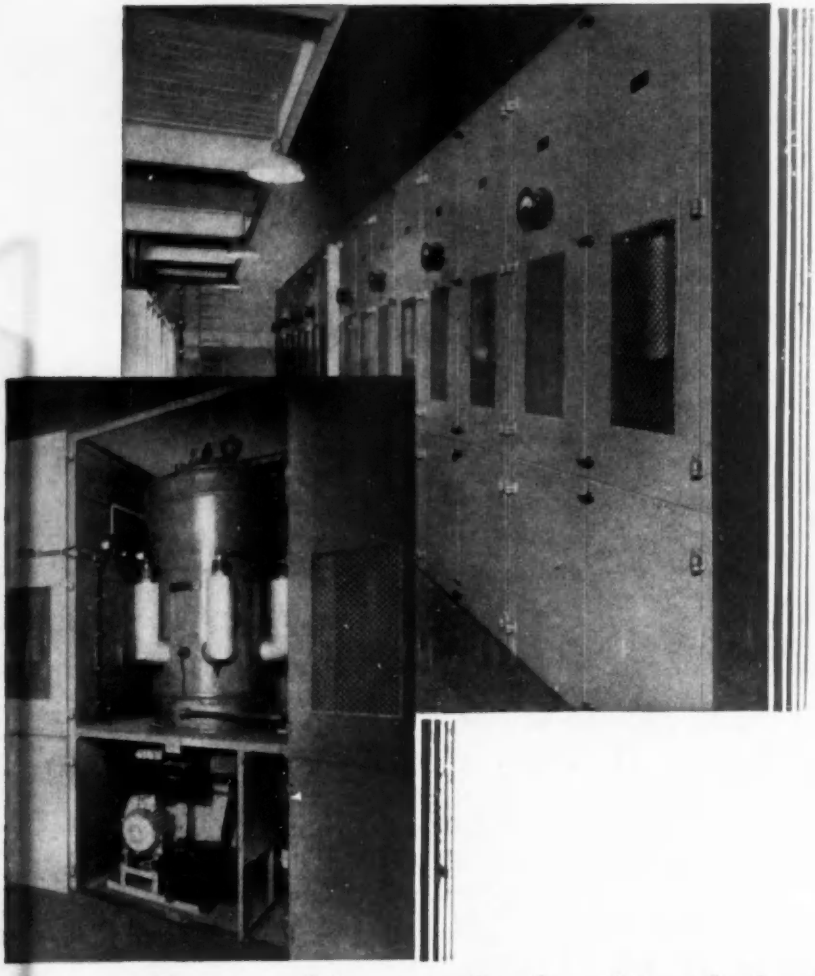

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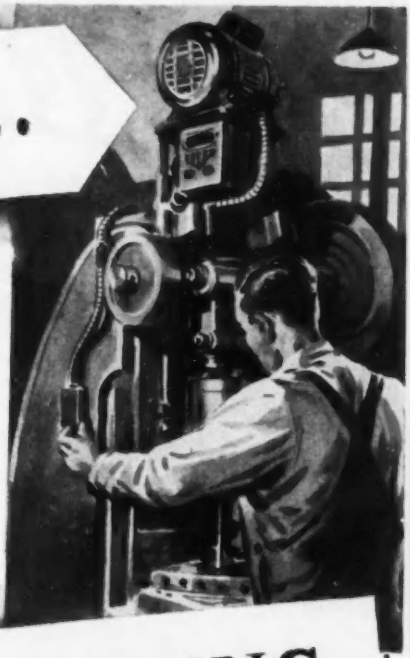

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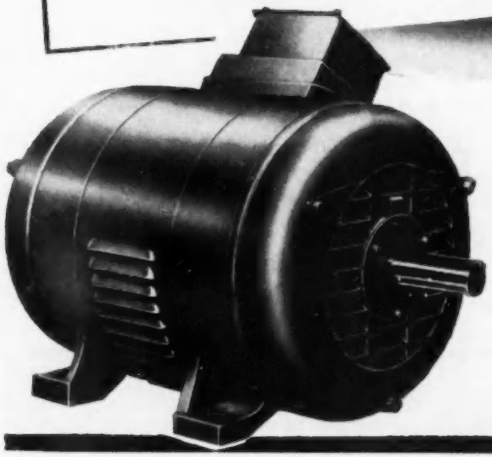

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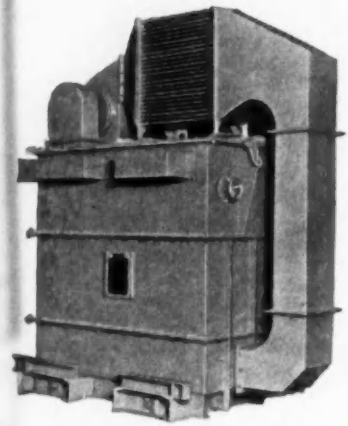
A 500 kVA enclosed air blast power station auxiliary transformer.



A 1,000 kVA enclosed air blast transformer, part of a rectifier installation supplying a chemical plant.

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have been specially developed for use in situations where risk of a running oil fire cannot be tolerated, e.g. in mines, chemical plants, power stations, and underground transport substations. They have these important advantages:

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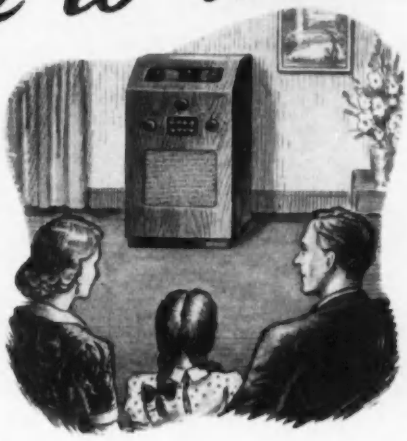

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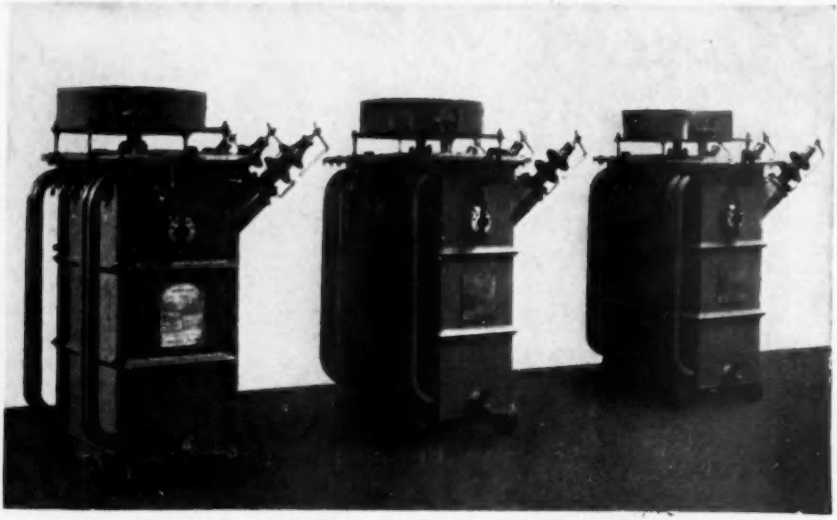

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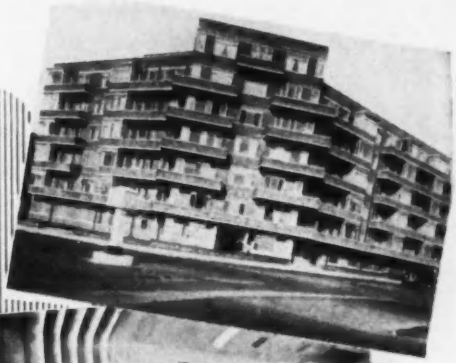

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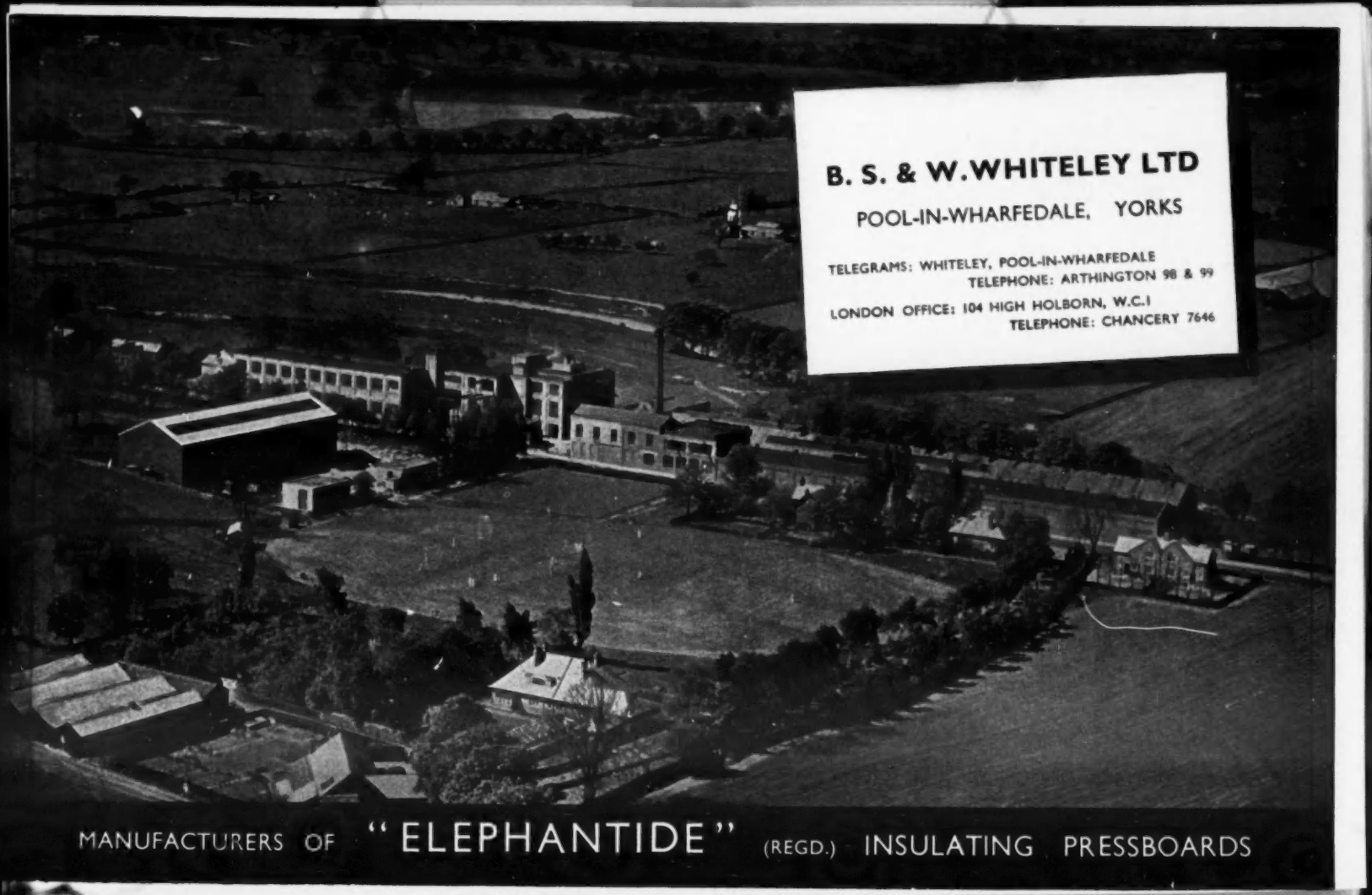
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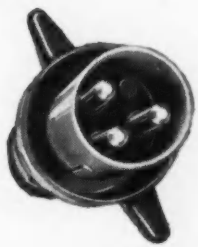

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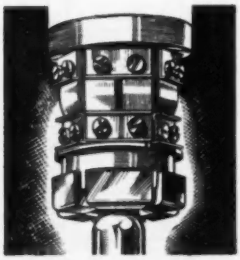

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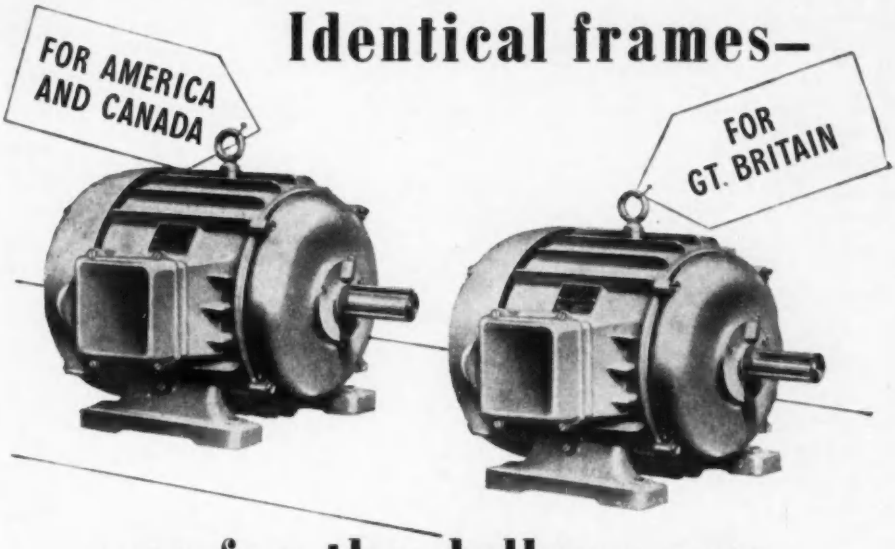

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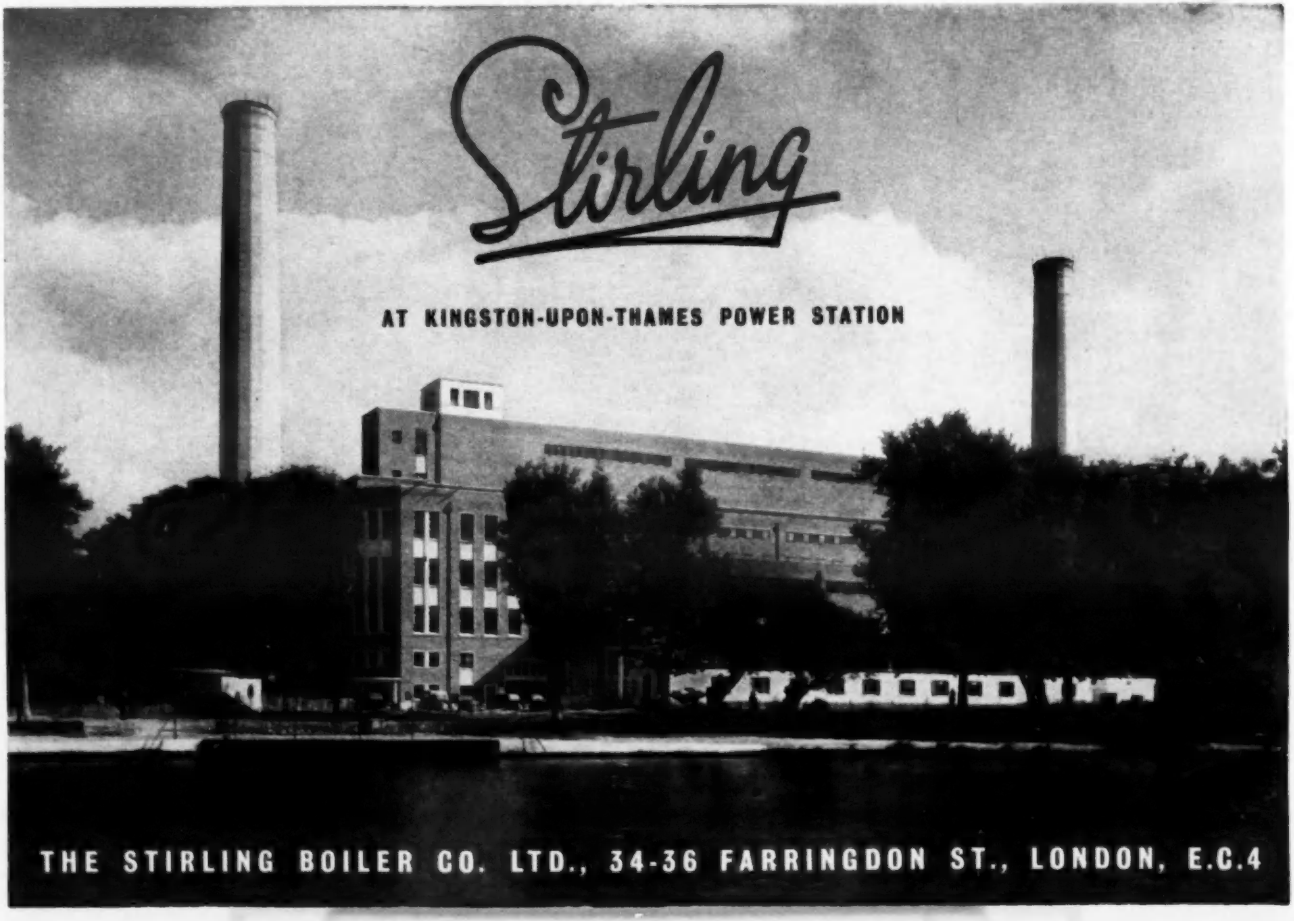
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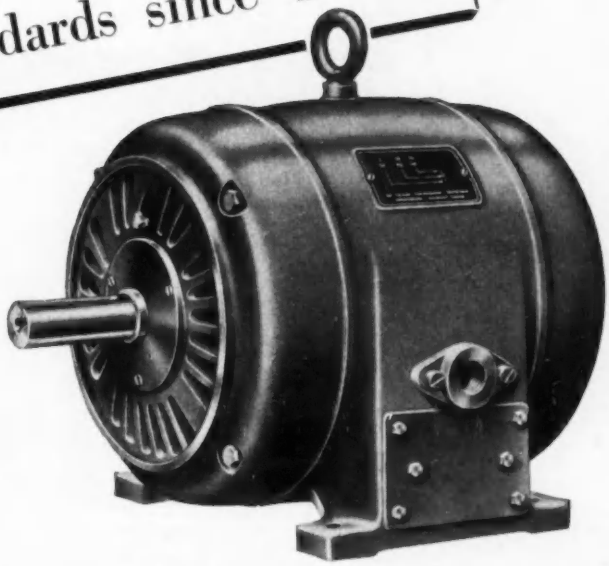

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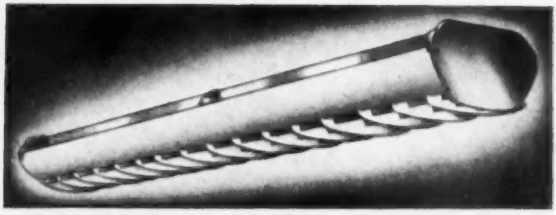

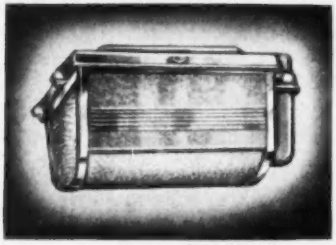

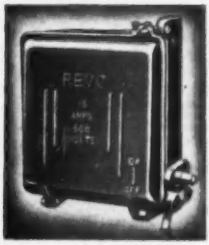

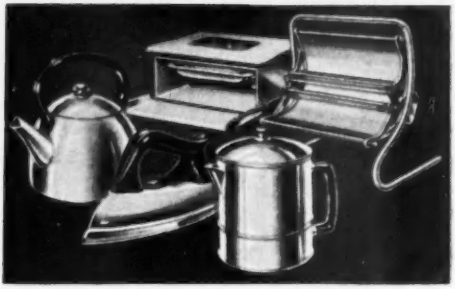

(*From left to right*)—Princess "464" Electric Cooker. One of a range of Decorative Lighting Fittings for fluorescent lamps. The "Silverblue" Street Lighting Fitting for mercury vapour discharge lamps. An example from the extensive range of Revo Switch and Fuse gear. The "Peerless" Electric Cooker for table use or with special stand. A group of Domestic Appliances. 8in. Electric Fan for desk or wall mounting.

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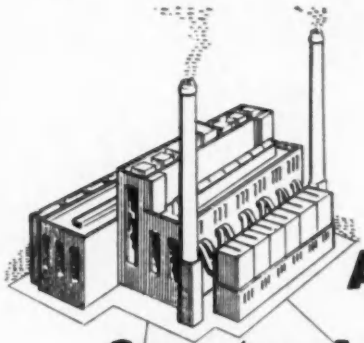

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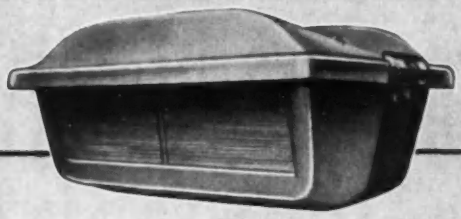

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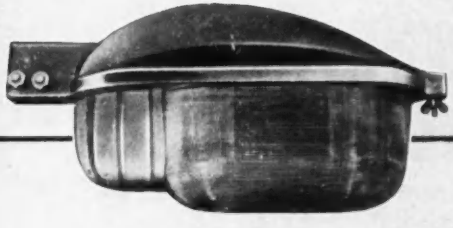

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ELECTRICAL TIMES

Vol. 118 No. 3072 THURSDAY, 21 SEPTEMBER, 1950

PUBLISHED EVERY THURSDAY

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Editorial

MATERIALS PRICE INDEX

USEFUL as general price indices may be in providing an overall picture, they are of little use for application to individual industries. We welcome, therefore, the decision of the Board of Trade to issue separate indices for basic materials used in specific industries and take as a compliment the choice of the electrical industry as the first to be so honoured. Details of the index are published later in this issue. The basic period chosen is June, 1949, and the prices of the 32 materials included in the index are weighted in accordance with their useage by the industry, as determined in the 1948 census of production. It is clearly stated that the index is related to electrical machinery, and indeed the various weights clearly reflect this. In consequence it is by no means applicable to the lighter side of the industry. The index, however, clearly shows the rapid rise in prices during the past few months. Devaluation has played a part in this but far more important is the ever upward trend of world prices which has set the index rocketing to 23% above the corresponding month last year.

INFORMATION v. GUESSWORK

IT HAS BEEN truly said that a circuit-breaker is like a standing army in peace-time. Expensive in first cost, it may do nothing at all for years on end. Then, in a few microseconds, it deals with heavier stresses than fall to the lot of the average machine during a lifetime, and whether it is successful or not depends chiefly on the way it was designed in the first place. Elsewhere in this issue the problems which arise in designing an oil circuit-breaker for service on 300 kV are discussed in an article which, besides its intrinsic interest, gives a fascinating sidelight on the progress which has been made in circuit-breaker design. Two decades ago the test plant was an ordeal for the designer, who watched the performance with something more than apprehension. Nowadays it is frequently possible to predict the performance while the breaker is still on the drawing-board. The test-plant is becoming less and less of a proving-ground for present manufactures, and more and more of a research laboratory for the breaker of the future.

WANTED—A YARDSTICK

AS IN MANY other sciences, however, each increase in knowledge brings fresh problems in its train. The switchgear designer no longer depends on our old friend "fortuitous turbulence" to extinguish his arc, but turns its own energy towards self-destruction, in one of many ingenious control devices. The breaking capacity equation still contains one important variable, however, which is not under the designer's control—the rate of rise of the restriking transient, or RRRV, which is a function of the inductance and capacitance of the system and not of the circuit-breaker itself. Since, even on any given power system, the RRRV may vary from hour to hour according to the connections of the network, it is extremely difficult to establish definite standards, so that the task of comparing two circuit-breakers, even made in the same country, becomes exceedingly difficult. Recognising that in certain circumstances the Achilles heel of a circuit breaker may prove to be the restriking transient, not the total MVA, some general agreement on methods of allocating ceiling values of RRRV, such as that suggested by Mr. H. Trencham at C.I.G.R.E., is a matter which merits serious attention at the earliest possible moment.

TECHNICAL ECONOMY

OFFICIAL publications produced by the Government and the nationalised industries generally fall into two categories: the legal and the informative. In the former fall the continuous stream of Statutory Instruments and Regulations, and into the latter the official reports and bulletins. It is, however, a fact worthy of note that the latter, usually the products of technical men, are generally concise, well written, and show common sense. These reflections were aroused by our receiving Information Bulletin No. EE(50)4 issued by the N.C.B. which deals with the use of flameproof and non-flameproof equipment in mines. While it can scarcely be said that the Bulletin contains anything new, it is an excellent example of clarity and conciseness, and will undoubtedly serve a most useful purpose in bringing before those concerned in the installation and ordering of mining electrical equipment the relative economics of flameproof and non-flameproof gear. With the increasing mechanisation of the pits, the money saved by judicious ordering and siting of equipment as recommended must run into many thousands of pounds.

FORCE OF HABIT

INSISTENCE on flameproof gear has become largely a question of habit. As the report rightly emphasises, no point is achieved in specifying flameproof gear operating in conjunction with non-flameproof equipment, such as a liquid starter, yet this is a frequent occurrence. The reason is not far to seek. Twenty-five years ago a great deal of the so-called "industrial" switchgear was not sufficiently dustproof, and "mining" type switchgear was frequently made in flameproof and non-flameproof varieties. With rationalisation in manufacturing methods and improvement in design, industrial gear became dust-tight and the non-flameproof mining gear became redundant. Many collieries, however, were prejudiced against ordering industrial gear, and continued to specify mining type gear where conditions did not necessitate it. There is, however, another viewpoint. Mining gear in the last 10 or 15 years has become so highly specialised in such matters as "dwarf" (i.e. low head room) units, built-in earthing switches, and special cable boxes, that it is not possible to provide mining requirements from standard industrial lines, and it is therefore just as cheap to provide a standard flameproof unit as to design a cheaper line especially for the few odd cases where the customer would accept them. If the N.C.B.'s message bears fruit we may see mining-type non-flameproof gear return to manufacturers' catalogues once more.

EELECTROMOTIVE FORCE

GLANCING through the papers published during the last few months regarding man's resources of energy, we are surprised, not to say disappointed, to find that no mention is made of the electric eel among fuel cell, solar, tidal, geothermal and deep-sea generation. Yet it is well known that the discharges of a full-grown eel may reach 500 V or more. If the B.E.A. are contemplating any work on this, may we suggest that Downton generating station offers an ideal spot for commencing research? According to a newspaper story some months ago this station (one of England's lesser-known hydro-electric plants) is already eel-conscious, a good night's catch from the screens being around 200 eels per night, although on one record occasion it reached 750. It should, therefore, only be necessary to re-stock the Avon with electric eels and build a series of fish traps above the screens to arrange the eels in series-parallel as they arrive. Or, since eels discharge d.c. at 400/500 pulses per second, it might be possible to arrange for them to swim through the window of a transformer core, thus giving direct generation at 800/1,000 c/s. It is true that the efficiency might be on the low side, but—despite newspaper reports to the contrary—the fuel cell is not so hot either.

Meteor

CIRCUIT-BREAKERS FOR 300 kV

—*Some Problems Associated with their Design*

by A. H. POLLARD,* B.Sc., A.M.I.E.E.

Part 2. Design and Testing of an Actual Equipment

THE importance of the circuit-breakers to be used at 300 kV obviously made it essential to scrutinise the service records of the existing types of breakers.

A final decision was made to develop a tank type breaker after a careful review of the lengths of operating experience, performance records and design considerations. The breaker finally developed has four breaks per phase, each break being shunted by a linear resistor having a sufficiently low shunt impedance to ensure that the natural distribution of the voltage is swamped. This arrangement has the additional advantage that the recovery voltage is divided in a known and positive manner, thus permitting unit testing, i.e. testing of individual breaks.

Fig. 1 shows a sectional drawing of one pole of this breaker rated at 300 kV 7,500 MVA in accordance with B.S. 116-1937, Pt. 2, Fig. 3 is an outline of the breaker and Fig. 2 a photograph of one phase of this breaker in the assembly shop.

The breaker was designed to clear a three-phase ungrounded fault on a 300 kV system with grounded neutral. Under this condition the first phase to clear experiences a recovery voltage equal to 1·5 times phase-to-neutral voltage, i.e. 260 kV.

A critical survey of the test reports together with oscillograms has indicated that this breaker with slight modifications can achieve a total break time not exceeding three cycles at all proving currents up to rated current of 14·5 kiloamps symmetrical and 18 kiloamps asymmetrical.

Tank Construction

A plan view of a conventional round tank breaker shows that on the diameter at right angles to a line joining the interruptors, the electrical clearances are excessive and unnecessary. This permits a lenticular design to be employed.

*Deputy Superintendent Engineer, B.T.H., Willesden

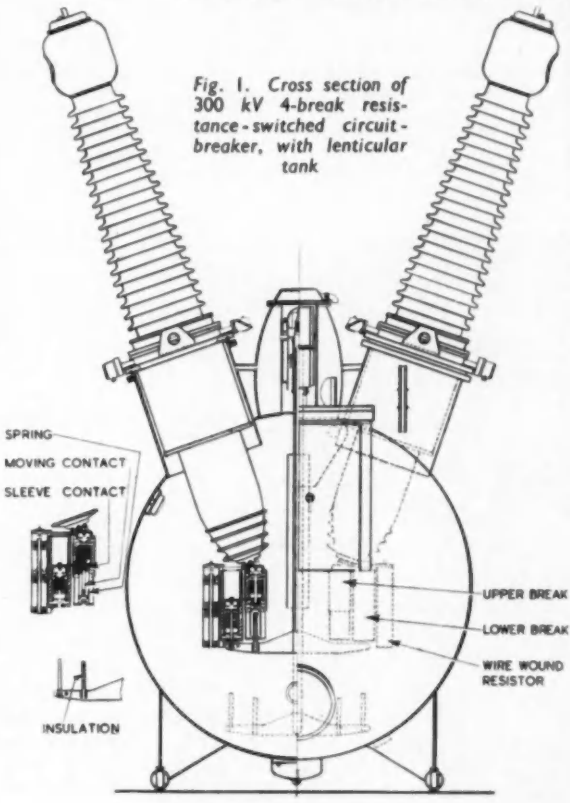


Fig. 1. Cross section of 300 kV 4-break resistance-switched circuit-breaker, with lenticular tank

The oil required for a round tank breaker is 50% more than that which is required for a lenticular design. This reduction in oil volume is obtained without any sacrifice of electrical strength.

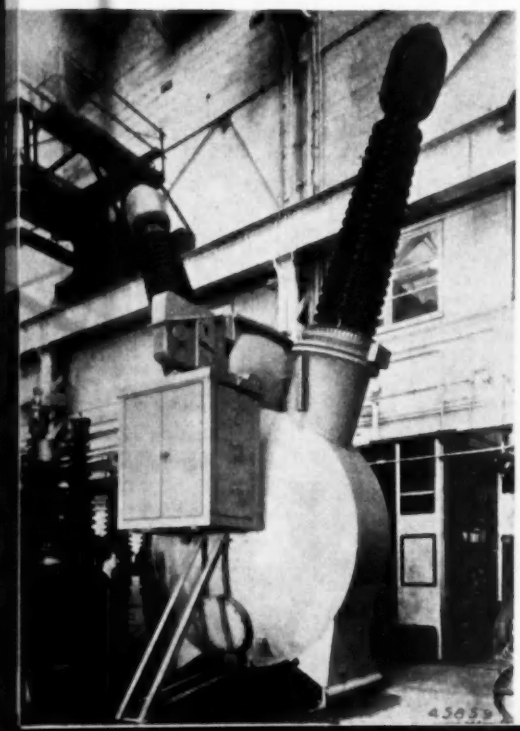
Mechanism Considerations

The mechanism must be suitable for long service, and the construction must be such that rapid movement of the moving parts combined with the operation of the interruptors gives short total break times. The mechanism must also be capable of instantaneous auto-reclosing.

It was decided to use four separate interruptors to obtain four breaks instead of two interruptors each housing two breaks as the contact element for the latter arrangement is of necessity long and the mass is large. On closing the breaker the crossbar hits these heavy masses at high speed, consequently high impact stresses can be set up in the mechanism and these stresses have a tendency to cause the breaker to fall out of adjustment.

With the four interruptor arrangement two contact rods are carried on the crossbar, and the only mass these contact rods encounter are the pivoted butt fingers. The crossbar also carries two push rods in densified laminated wood tipped with duralumin. When the breaker closes these push rods close the two contact rods of the two inner breaks whilst the two contact rods on the crossbar complete the circuit in the two outer breaks. The lower ends of the two inner contact rods are spring loaded, so that their mass is picked up with the minimum shock. The duralumin tips were examined after well over 200 tests under short circuit conditions and no trace of hammering could be found: the machine marks in the duralumin being as clearly defined as at the commencement of the tests. The breaker also was carefully checked over and the mechanical settings were found to be the same as when testing started.

Fig. 2. A single-pole unit of the 300 kV circuit-breaker in the assembly shop



Total Break Time

The total break time is the summation of certain time intervals, and the methods adopted to reduce these times to a minimum are as follows:

Time from Trip Impulse to Trip Latch Release. The magnetic trip circuit is completely laminated, the time constant of the coil reduced to a minimum and the moving parts, not required for the magnetic circuit, made in duralumin.

Time from Trip Latch Release to Movement of the Breaker Crossbar (Dead Time). A usual method of retaining a closing mechanism in the closed position is by a series of toggles, the final abutment of which is the trip latch. This permits trip coils with small kilowatt consumption to be used for large breakers. It will be appreciated that the toggles farthest from the breaker have to perform a considerable part of their total "break-up" movement before the crossbar starts to move; consequently the toggle trains must move as rapidly as possible.

The dead time is reduced by opening out the toggles as far as possible, without any undue increase in the trip latch loading, making the moving parts in duralumin and reducing the friction by making the pins in high tensile stainless steel, so permitting a reduction in their diameters, thus reducing the friction circles. The stainless steel pins are finished with colloidal graphite so as to further reduce friction. Ball bearings are also fitted where necessary.

Time from Commencement of Movement of Breaker Crossbar to Parting of Arcing Contacts. This time is mainly dependent on the parts to be moved, the accelerating force available and the type of contacts.

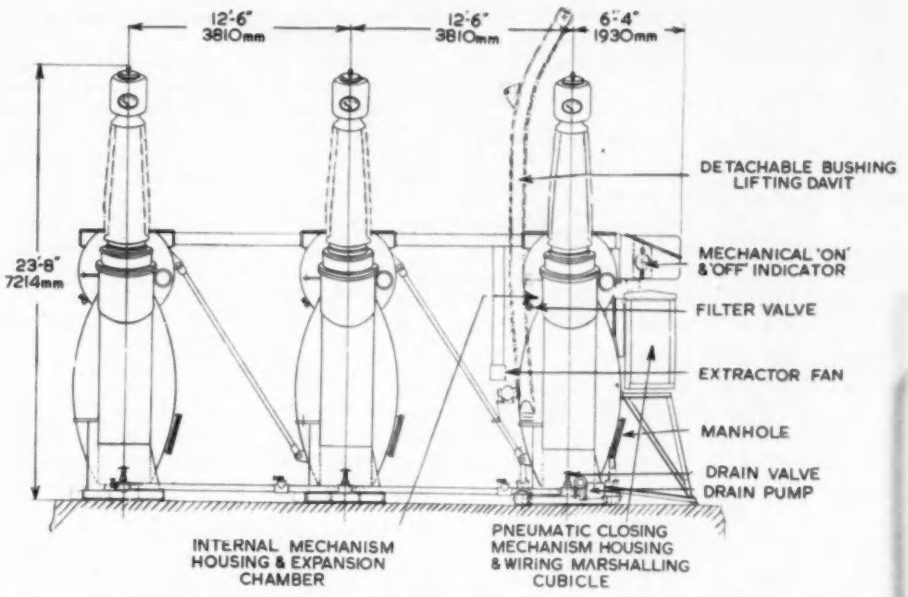


Fig. 3. Block outline of 3-phase unit with operating mechanism, showing bushing lifting davit in position

Metal parts moving at high speed are constructed of light alloys, specially shaped so that strength and rigidity are not sacrificed, and the tension rods made in a special section of laminated densified wood. These measures greatly reduce the effective mass of the moving parts inside the breaker tank.

It has been found, in this type of breaker, that if a helical accelerating spring is used, the equivalent mass of the accelerating spring is approximately one-third of the total equivalent mass of the breaker at the commencement of the stroke. This means that about one-third of the spring energy is being wasted in accelerating its own free end. To eliminate this waste of energy, torsion bar springs, which have negligible effective mass, are used. Arrangements are also made so that a large proportion of the energy is transferred to the moving parts at the commencement of the stroke; consequently, a high speed of acceleration is given to the moving parts and contact separation is very rapid. Crossbar travel, prior to contact separation, is reduced to a minimum by the use of pivoted butt contacts.

Time from Parting of Arcing Contacts to Arc Extinction. This time is dependent on two considerations; first, the amount of contact separation necessary before the arc can be extinguished by a particular arrangement of interruptors, and secondly, by the speed of movement of the contacts.

It will be appreciated that the arc must be drawn to a certain length, depending upon the voltage, before it can be successfully extinguished by the interruptors. For a given crossbar speed with four series breaks the total length of the arc increases at twice the rate of a two-break arrangement.

An accelerating force is maintained on the moving parts so that no limitation in speed due to fluid friction, etc., is experienced.

A mechanically trip free pneumatic closing mechanism was used for all the tests, as this is the most suitable for such large breakers.

Interruptors and Resistors

The two copper pivoted butt contact fingers shown in Fig. 4 make directly on to the contact rod, and will easily make peak currents of 37 kA without requiring facing with any material such as tungsten. They also have ample margin for the short time rating of 14·5 kA for 5 seconds.

When the contact rods on the outer interruptors are withdrawn, gates located at the throat automatically shut, thus preventing the emission of gas through the throat of the interruptor. Similarly with the interruptors

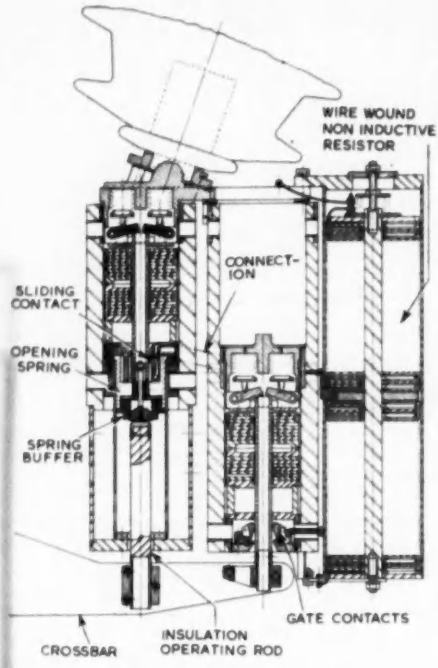


Fig. 4. Enlarged section of contact unit

located towards the centre of the breaker, the contact rods form an effective seal. The sealing of the throats conserves the pressure inside the interruptors longer than would be the case if gates were not used, thus maintaining the dielectric strength of the gas inside the interruptor, and eliminating late restrikes during the clearance of a fault. The maximum arc duration on any proving test was less than 0·04 seconds and occurred during the interruption of 10% of the rated breaking capacity. These short arcing times result in small burning of the contacts, negligible erosion of the arc splitter plates and only very minor carbonisation of the oil.

The resistors shunt the whole of the interruptor, being solidly connected to the interruptor head casting at the upper end of each interruptor, and at the other end to a spring loaded contact, located in the throat, which bears on the moving contact rod.

The resistor is a continuous length of DCC nickel chrome wire, alternate layers being wound in opposite directions, so that the assembly is virtually non-inductive. The resistors are worked at very low temperature, not exceeding 100° C; consequently the nickel chrome wire remains strong and ductile.

A further advantage of the resistors is that when the breaker is in the open position, the top and bottom of the interruptors have the same potential and the interruptor insulation is relieved from having to withstand high voltage gradients over prolonged periods.

An oil circuit-breaker is not sensitive to RRRV when interrupting currents approaching its rated capacity, owing to the high internal gas pressure in the interruptor and the severe de-ionising effect of the side jets. However, at arc currents corresponding to, say, 10% of its rating, the breaker is sensitive to RRRV as the gas pressure inside the interruptor is low and the de-ionising action of the jets is much

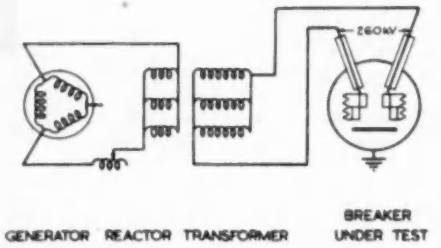


Fig. 5. Connections for single-phase tests

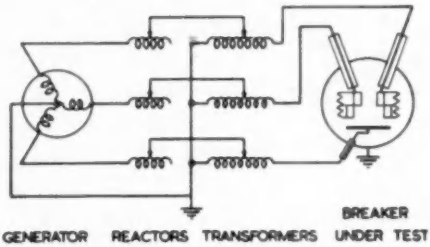


Fig. 6. Connections for 3-phase tests on one pole

reduced. Unless this condition is compensated, much longer arcing times would be obtained at the lower end of the breaking capacity range. Consequently the resistors are arranged so that the RRRV rises logarithmically at the lower end of the breaking capacity range at the higher frequency restriking transients. This form of interruptor was also tested with fault currents of the order of 1 kA with restriking transients of low frequency, and the arc duration was for all practical purposes independent of the frequency of the restriking transient. Thus the fitting of resistors to the

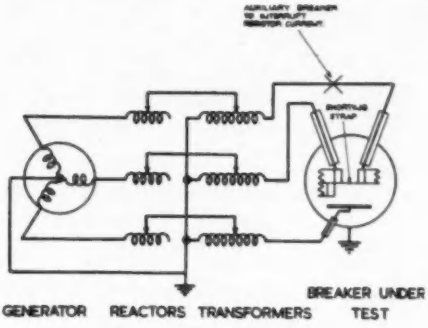


Fig. 7. Connections for 3-phase tests on three interruptors of one pole

breaker gives shorter arcing times, on the low fault currents, than would otherwise be obtained.

Maintenance

A tank type oil circuit-breaker is a comparatively simple piece of apparatus and normal maintenance can be carried out without specialised mechanical skill.

A centrifugal pump is fitted to each three-phase breaker and will empty the oil of a single-phase tank in 10 minutes. As maintenance is carried out at ground level, the necessity of employing ladders, platforms, derricks, etc., is avoided.

Adequate illumination is provided by permanent lights installed inside the oil circuit-breaker tank controlled from the mechanism cubicle, and an air extractor fan is provided to ensure fresh air inside the breaker tank during maintenance.

Protection from the weather is automatically provided by the tank itself, so that maintenance can be carried out without interruption under all weather conditions.

The arc control chambers can be handled by one man and contact change for one phase can be carried out in half an hour.

The complete operation of removing the oil, changing the contacts and refilling one phase can be carried out by one man in 1½ hours. With additional personnel the maintenance of a complete three-phase breaker can be carried out in 2½ hours.

Breaking Capacity Tests

A series of breaking capacity tests based on B.S.116-1937, Pt. 2, was successfully carried out at the Switchgear Testing Co., Manchester, the test connections being modified to obtain a wide range of breaking capacity duties. See Table 1.

Single-Phase Tests on One Pole. Series 1 (Items 1-5). The test connections were in accordance with Fig. 5.

This series comprised single-phase tests on one pole at 260 kV recovery voltage across four breaks in series.

These tests demonstrated the ability of the breaker to clear short circuits of low current value, and also its ability to break the residual current of the voltage dividing resistors when energised to 1·5 times line to neutral voltage.

Unit Testing. As the recovery voltage is divided in a known and positive manner across the breaks, unit tests were carried out.

Three-Phase Tests on One Pole. Series 2

TABLE I
BREAKING CAPACITY TESTS

OPERATION		ITEM No.	DUTY		BREAKING CURRENT RMS kA	BREAKING CURRENT ASYM. kA	RECOVERY VOLTAGE PER POLE kV		RECOVERY VOLTAGE PEAK kV		ARC CONTACT TIME m/sec		TRANS. FREQ. PER SEC.	SHORT CIRCUIT RATING
NONE	1 POLE				14·4	18			500					
NONE	1 POLE				14·4	18	260							
PERFORMANCE	SHORT PHASE TEST ON ONE POLE	1A	10 SHORT CIRCUIT PERFORMANCE	0	1150	1150	268		509	105	5 6	5 4	8 0	
		1B		0	1150	1150	268		509	105	2 6	2 9	7 5	
		1C		0	1150	1150	268		509	105	3 4	3 2	7 5	
		2A		0	605	611	265		505	101	4 0	3 5	4 5	
		2B		0	605	611	265		505	101	2 6	2 9	4 2	
		2C		0	611	611	265		505	101	2 9	3 0	4 5	
		3A		0	909	912	266		509	105	3 7	3 4	2 1	
		3B		0	905	908	266		509	105	3 0	3 1	2 1	
		3C		0	909	905	268		509	105	3 0	3 0	2 1	
		4A		0	189	189	268		509	105	3 0	3 0	1 8	
		4B		0	189	191	268		509	105	2 8	2 9	1 8	
		4C		0	185	189	268		509	105	3 1	3 0	1 8	
		5A	EXTRA TESTS AT LOW CURRENT	0	079	079	265		505	101	1 8	2 9	0 9	
		5B		0	079	079	266		509	105	2 2	2 7	0 9	
		5C		0	075	079	265		505	101	3 1	3 1	0 9	
NONE	3 PHASE							150						
PERFORMANCE	3 PHASE TESTS ON ONE POLE	6A	EXTRA TESTS AT LOW CURRENT WITH RESTRIKING CHARACTERISTICS	0	196	197		158	518	106	3 1	3 1	5 9	
		6B		0	195	195		158	518	106	3 4	3 5	5 4	
		6C		0	196	197		158	521	107	3 3	3 0	5 9	
		7A		0	2 06	2 00		158	514	105	3 0	3 0	19 5	
		7B		0	2 06	2 00		159	521	107	3 5	3 2	19 5	
		7C		0	2 08	2 08		159	521	107	3 6	3 3	20	
NONE	3 PHASE							75						
PERFORMANCE	3 PHASE TESTS ON 3 INTERRUPTORS	8A	100% SYMMETRICAL	0	50 8				125	41	1 0 0 89	2 2	115	
		8B		0	50 5				121	40	1 0 0 89	2 9	115	
		8C		0	51 2				125	42	1 0 0 92	2 2	118	
		9A	100% ASYMMETRICAL	0	52 9				132	44	1 0 0 98	2 0	112	
		9B		0	53 5				135	44	1 0 0 95	2 4	119	
		9C		0	53 5				135	44	1 0 0 95	2 2	117	
		10A	80% SYMMETRICAL	0	51 2				209	68	1 0 0 96	2 3	71	
		10B		0	51 0				204	68	1 0 0 96	2 4	70	
		10C		0	50 6				202	67	1 0 0 96	2 3	70	
		11A	80% ASYMMETRICAL	0	79 5				294	98	1 0 0 96	3 1	92	
		11B		0	74 9				298	99	1 0 0 96	2 9	92	
		11C		0	74 2				297	99	1 0 0 96	3 1	92	
		12A	100% SYMMETRICAL	0	80 6				322	107	1 0 0 96	3 3	12	
		12B		0	84 0				336	112	1 0 0 96	3 3	12	
		12C		0	84 9				339	113	1 0 0 96	3 0	12	
		13A	EXTRA TEST AT REDUCED VOLTAGE	0	40 7				163	54	1 0 0 96	2 4	93	
		13B		0	41 0				164	55	1 0 0 96	2 4	93	
		13C		0	41 0				164	55	1 0 0 96	2 6	93	

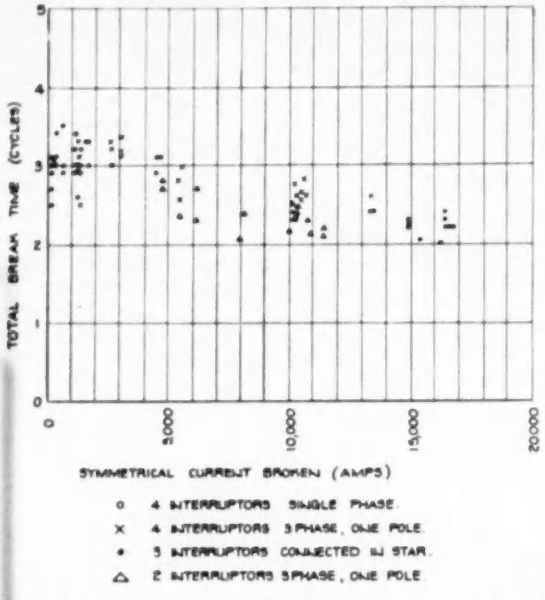

TOTAL BREAK TIME (CYCLES)
SYMMETRICAL CURRENT BROKEN (AMPS)
4 INTERRUPTORS SINGLE PHASE
4 INTERRUPTORS 3 PHASE, ONE POLE
3 INTERRUPTORS CONNECTED IN STAR
2 INTERRUPTORS 3 PHASE, ONE POLE

Fig. 8. Chart showing breaking capacity performance using different interruptor connections

(Items 6 and 7). The test connections are shown in Fig. 6.

For this series the whole three-phase output is broken by the four breaks on one pole. Two phases of the test plant are connected to the two bushings, whilst the third phase is connected to the crossbar by a flexible connection passing through a third bushing brought through the wall of the tank. Line voltage of the test plant is thus impressed across two breaks in series and 100% recovery voltage is represented by 130 kV line volts.

Three-Phase Tests on Three Interruptors for One Pole. Series 3 (Items 8-13). The test connections are shown in Fig. 7.

For this series the three-phase plant output is broken by three of the four breaks of one pole, the short circuit point being ungrounded and being formed by a starpoint inside the breaker. In this case the first phase to clear is subject to a recovery voltage of 1·5 times test plant phase voltage. In effect 100% recovery voltage is represented by 75 kV line voltage. In this series the resistor current of one break is broken at the breaker crossbar, but an auxiliary

TABLE II

AUTO RECLOSING TESTS

DESCRIPTION		ITEM No.	DUTY	MAIN ARC QUAD TIME SECS.	1½ ½~ MAX PEAK K.A.	BREAKING CURRENT SYMM. K.A.	BREAKING CURRENT ASYM. K.A.	RECOVERY VOLTAGE KV. PER INTERRUP.	RECOVERY VOLTAGE KV. PER POLE	RECOVERY VOLTAGE KV. EQUIV. 3Ø LINE	RECOVERY VOLTAGE KV. % RATED VOLTAGE	ARC DURATION SEC. x10⁻²	TOTAL BREAK TIME IN CYCLES
RATING	3 POLE									300			
	1 POLE								173				
	1 INTERRUPTR							43·3					
PERFORMANCE	SINGLE PHASE TESTS ON ONE POLE	1A	B.O.M.	—		1·42	1·42		180	312	104	2·5	2·6
		1B	B.O.M.	—		1·42	1·42		180	312	104	3·0	3·0
		2A	B.O.M.B.	·25		1·42	1·42		178	308	103	2·9	2·9
					3·14	1·24	1·26		164	284	95	2·6	2·6
		2B	B.O.M.B.	·25		1·39	1·40		178	308	103	3·2	3·1
					2·92	1·29	1·29		164	284	95	2·9	3·0
	THREE PHASE TESTS ON 2 INTERRUPTORS	3A	B.O.M.B.	·27		6·09	6·38	63·3		440	147	1·3	2·3
					10·6	4·88	4·90	53·3		370	123	2·3	2·7
		3B	B.O.M.B.	·26		6·15	6·26	64·1		440	146	1·9	2·7
					11·0	4·88	4·90	52·6		364	121	2·6	2·8
		4A	B.O.M.B.	·27		11·5	12·0	43·1		299	99	1·4	2·2
					24·7	10·1	10·1	37·9		262	87	2·1	2·5
		4B	B.O.M.B.	·27		11·5	11·9	44·5		308	103	1·1	2·1
					23·2	10·3	10·3	38·2		265	88	1·9	2·4

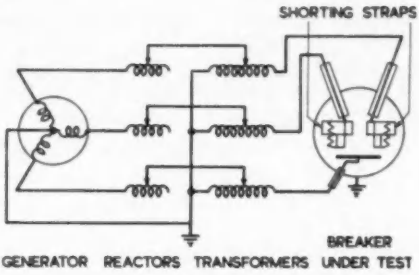


Fig. 9. Connections for 3-phase tests on two interruptors of one pole

break has to be introduced into one line to break the resistor current of the other two breaks.

Fig. 8 has been prepared to show the total break times of the breaker plotted against the symmetrical current broken. The points shown on this figure cover the results in Table 1 and also additional tests that were taken. It will be seen that similarity of breaker performance is obtained with the different forms of test connections.

At small values of short circuit current (Items 1-5 inclusive) low power factor inductive currents varying from 75 amps to 1,150 amps were broken with 268 kV across one pole of the breaker.

The arc duration did not exceed 0·04 secs and the total break time did not exceed 0·07 secs or 3½ cycles on a 50-cycle circuit.

At rated short circuit (Items 8 and 9), the arc duration did not exceed 0·016 secs, whilst the total break time kept below 0·05 secs or 2½ cycles on a 50-cycle circuit.

The tests at rated current were taken at not less than 40% of rated voltage against 30% minimum allowed by B.S. 116-1937 for a 1,500 MVA breaker.

One set of contacts was used for the complete B.S. series of proving tests. After the completion of the tests it was found that the contact wipe had only been reduced by one quarter of an inch.

The visual behaviour of all tests was similar to that obtained on no load operation, except that on the 100% test a certain amount of ground vibration was observed.

Auto-Reclosing Tests

As the tests are intended to demonstrate single-phase auto-reclosing the test voltage per pole is phase voltage and not one and a half times phase voltage. (See Table 2.)

Test Item 1, *connections to Fig.* 5. These show that the breaker can clear a fault across a 52-in. rod gap to earth and re-establish 180 kV across it again, 16 cycles after the trip coil was energised. The arc across the rod gap did not re-ignite.

Test Item 2, *with connections to Fig.* 5, and Items 3 and 4, with connections to Fig. 9, show the breaker interrupted two short circuits in rapid succession with less than 14 cycles between the clearance of the first fault to the establishment of the second.

An examination of Fig. 10, which is a reproduction of the electromagnetic oscillogram applying to Item 1b, shows that the arc across the rod gap does not re-ignite.

Conclusions

From theoretical considerations and actual test results the following conclusions can be drawn :

(*a*) Tests on the breaker described have demonstrated that it is suitable for operation on 300 kV 7,500 MVA systems. The 100% tests show a breaking capacity rating of

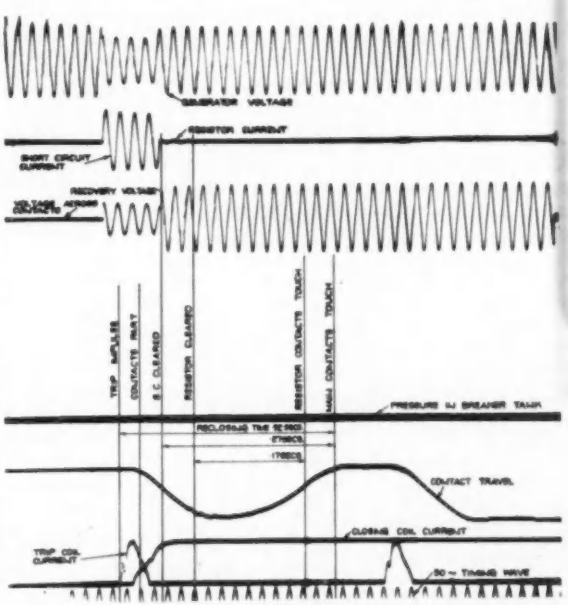


Fig. 10. Electromagnetic oscillogram of Test No. 1B (Table II)

8,200 MVA when calculated on the British method of computation and 10,200 MVA based on the American method of calculation.

(*b*) The breaker is not sensitive to the rate of rise of restriking voltage and can be installed in any location on a 300 kV system provided that the available short circuit does not exceed its MVA rating.

(*c*) The breaker is suitable for instantaneous auto-reclosing duty.

(*d*) Provision being made to ensure equal division of recovery voltage over the four breaks of a single-phase unit, each interruptor (when tested at its share of the recovery voltage at a given current) can be considered to have been subjected to a duty comparable to that imposed during an interruption by a complete single-phase unit with four interruptors, tested at the same current and four times the recovery voltage.

(*e*) The over-voltages produced when switching are considerably less than those which can occur with non-resistance-switched breakers.

(*f*) A high speed breaker can be manufactured, without excessive closing force being required, provided it is correctly designed and particular emphasis is given to the proper selection of materials.

(*g*) The robustness of a tank type breaker, with its high level of insulation, make it eminently suitable for outdoor location.

(*h*) Mechanical simplicity is combined with ease and speed of maintenance.

(*i*) Ample accommodation for current transformers is provided in the bushings and voltage indication is easily available.

(*j*) A critical survey of the results of the tests provides sufficient information to ensure that with minor modifications to the breaker the total break time can be reduced to 3 cycles at all proving capacity ratings.

The author thanks the British Thomson-Houston Co. Ltd. for permission to publish the matter given in this article.

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[1] Cox, H. E., and Wilcox, T. W. "The Performance of High Voltage Oil Circuit-Breakers, Incorporating Resistance Switching." Journal I.E.E., 1947, 94, Part II, p. 351.

[2] Cox, H. E., and Wilcox, T. W. "The Influence of Resistance Switching on the Design of High Voltage Air-Blast Circuit-Breakers." Journal I.E.E., 1944, 91, Part II, p. 483.

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Electricity in Mines

Use of Non-flameproof Equipment Below Ground

OWING to the wide difference in cost between flameproof and non-flameproof equipment, the National Coal Board has issued an information bulletin, No. EF(50)4, advising on the use of non-flameproof electrical apparatus below ground. It is pointed out that the Draft Electricity Regulations read that: "In any seam in which safety lamps are used the following requirements shall apply, except as hereinafter provided, to all apparatus used at or within 300 yd of the working coal face and to apparatus used in any other place if in that place the representative firedamp content in the general body of the air exceeds 0·5 per cent."

Thus, non-flameproof gear can legally be used anywhere on the intake side up to the 300 yd limit and in many places in the return airways provided that the firedamp content does not exceed 0·5%.

Many anomalies in the use of flameproof equipment are quoted. Large inbye transformers are usually non-flameproof and are kept just outside the 300 yd limit, yet motors in the same location are almost invariably flameproof.

Solenoids on large haulages are frequently enclosed while the main driving motors are non-flameproof. Similarly flameproof contactor gear and circuit breakers are often found operating in conjunction with liquid starters which cannot be certified.

It is further pointed out that due to lack of demand some of the manufacturers have discontinued the design of non-flameproof mining equipment, but the bulletin considers there is some industrial-type switchgear quite suitable for the onerous conditions and that standard non-flameproof motors with a steel carcase are generally satisfactory.

In conclusion, an appendix is given showing the comparative costs of flameproof and non-flameproof equipment. As far as motors are concerned, the former costs 36·2% more than the latter.

Our readers' views . . .

Plug and Socket Plastics

YOUR correspondent, "Realist," in his letter in your issue of August 31, appears to be concerned mainly with the manufacturing aspect of the above subject. I appreciate that this viewpoint is of considerable importance, and any constructive criticisms by manufacturers will, no doubt, be welcomed both by other manufacturers and by users. He seems, however, to infer that those who advocate the use of "non-track" plastics have "dangerously wild opinions," but if this is so, current practice indicates that these opinions are held by a number of manufacturers and by countless users.

As stated by "Realist," phenolic plastics are regarded as being officially approved for the purpose, but so also are amino-plastics. It is generally agreed that for parts of plugs and sockets which are not in contact with "live" conductors phenolic plastics are more suitable from all points of view, but a definite difference of opinion exists when consideration is given to other parts. The point at issue appears to be whether "non-track" or "tracking" plastics should be used for parts in contact with "live" conductors after taking all relevant properties of the two materials into account.

This resolves itself into balancing the non-track property of urea-formaldehyde against the better mechanical properties, the lower water absorption, and the greater stability under certain conditions, usually possessed by phenolic plastics. The problem of selecting a suitable material is by no means simple as one manufacturer of material lists well over 50 phenolic moulding materials with widely varying properties, and in addition there are the non-track urea-formaldehyde and melamine-formaldehyde and casein materials to be considered as well as combinations of these.

The question as to whether the increased cost caused by manufacturing "non-track" components is justified is answered by their present widespread use. There will always be a market for the cheaper components, but from the viewpoint of the consumer the increase in cost per installed plug point involved by the use of "non-track" components is negligible.

I read with interest the contribution on Tracking Troubles made by Mr. J. Snaddon in your issue of September 7. The trouble described would not have occurred if "non-track" materials had been used, and there is little doubt that considerable time and material are at present being expended in replacing components which have failed due to tracking.

F. R. Haigh

FARNWORTH, NEAR BOLTON.

◆ ◆ ◆

More Maintenance Handicaps

WITH reference to the letters on "More Maintenance Handicaps," I should like to make the following comments:—

Whilst it would be helpful to have bearing sizes stamped on the nameplate, surely the obvious way to avoid a hold-up in the event of a breakdown is to have replacements available, especially for the most important machines. If this is not possible the next best thing would be to have a list of all machines and their bearing details. This information should be readily available from the manufacturers on quoting the machine serial number. A good maintenance man should watch for bearing trouble as failure does not usually occur suddenly, being preceded often by noise, vibration, heat, etc. Replacement can then be effected comparatively leisurely.

It seems to me that "Wirebuster" is referring only to the smaller sizes of machine but he should remember that large machines can have an appreciable saving made in cost (important to the manufacturer) by fitting the cheaper ball bearing at the N.D.E. instead of a roller bearing at each end, a roller bearing usually being desirable at the D.E. Where a roller bearing is fitted at each end, it is necessary to have also a ball bearing for location purposes.

If manufacturers standardised on cartridge-type housings for all machines, then it would be possible to have interchangeable endshields so long as they are absolutely identical. The housing could be bored for different size bearings and have the same outside diameter, with, of course, a suitable spigot on the bearing caps. In any case it is a poor workman who cannot figure out which end is which when reassembling a machine.

T. L.

LEICESTER

PUBLIC LIGHTING—1950

First Proceedings of the Bournemouth Conference

FIRST item on the programme for the 1,000-odd delegates attending the annual conference of the Association of Public Lighting Engineers, which opened at Bournemouth on Monday, was the Annual General meeting.

This was followed by the induction of the new President, Mr. P. Richbell, M.INST.GAS.E., who is distributing engineer for the East Surrey Division of the South-Eastern Gas Board. After this the Mayor, Councillor S. A. Thomson, J.P., officially opened the Conference and Exhibition. Monday's proceedings ended with a civic reception by the Mayor and Mayoress to delegates and their ladies.

The President

Presidential Address

Thanking the Association for the honour conferred upon him, Mr. Richbell pointed out that he regarded this as a compliment to the gas industry, in which he had been engaged for forty-three years, during the last twenty-five of which he had been actively associated with the development of public lighting.

He referred to the address given by the immediate Past-President, Mr. A. S. Tapsfield, at last year's Conference, when it was pointed out that the Association had reached a decisive stage in its career, due to the transfer of both electricity and gas to public ownership. It was therefore of interest to note that of the three outstanding points in the revised articles of association the foremost was the formation of a new class of "Group" membership, by which corporate members of the Association might represent nationalised and other bodies. This class of membership met the needs of both the Gas Council and the B.E.A., who had requested Area Boards to consider the desirability of becoming a Group member—apart from delegates appointed for the Conference.

The second important revision was the admission of technically qualified representatives of manufacturers into the public lighting field as corporate members of the Association. Thirdly, the old rule restricting membership to senior executives of undertakings and municipalities had now been scrapped, and any member of the staff of a public lighting department could now become a member—providing he held the necessary technical qualifications.

Inquiries had been made on several occasions regarding raising the status of the Association to Institution level. It was felt, however, that this was not possible until the membership had considerably increased and was regulated by compulsory examination.

Activities in connection with other public bodies were then reviewed, the President dealing first with the Ministry of Transport as the central authority for street lighting since 1946. The Association had collaborated on various matters, notably the general improvement in the standard of lighting. It was felt, however, that the present standard was far from adequate in modern traffic conditions. Lighting had for too long been the Cinderella of public services, and although the Ministry were empowered to make grants in aid of new Class A schemes, small local authorities were unable to support the proportion of the cost to be borne by them. He felt that a percentage of the receipt from motor licences should be transferred to a public lighting fund.

The M.o.T. had stipulated that the design of street lighting equipment on Group A trunk roads should be approved by the Royal Fine Art Commission, and he endorsed their view, but pointed out that this did not—in spite of a widespread impression amongst local authorities—apply to Class B roads, although he personally hoped that some of the monstrosities to be seen at present would be cleared away at the earliest opportunity.

Activities with the B.S.I. were also dealt with, after which the President briefly reviewed the history of public lighting, and the present trends. He concluded with an appreciation of the co-operation of manufacturers in the provision of the exhibition.

Further Proceedings

Following the Presidential Address, delegates paid an official visit to the exhibition of street lighting equipment. As we were closing for Press on Tuesday afternoon, Dr. J. W. T. Walsh, M.A., D.SC., M.I.E.E., was opening a discussion on the draft Code of Practice for street lighting in Class "A" roads, some account of which will appear next week.

A.P.L.E.

1950 CONVENTION

THE manufacturers' exhibition held in connection with this year's Convention, while smaller in number than last year, shows a notable increase in new designs of lantern, particularly in the case of fluorescent units arranged for vertical burning. Held in the Town Hall, the exhibition is supported by the usual outdoor display of poles and columns, tower wagons and extending ladder and maintenance equipment, which is arranged in Braidley Road, outside the Town Hall.

Automatic Telephone and Electric Co., Ltd. (29)

The entire stand is devoted to a display of "Rhythmatic" ripple control equipment, an installation destined for Chorley, in Lancashire, being shown in operation.

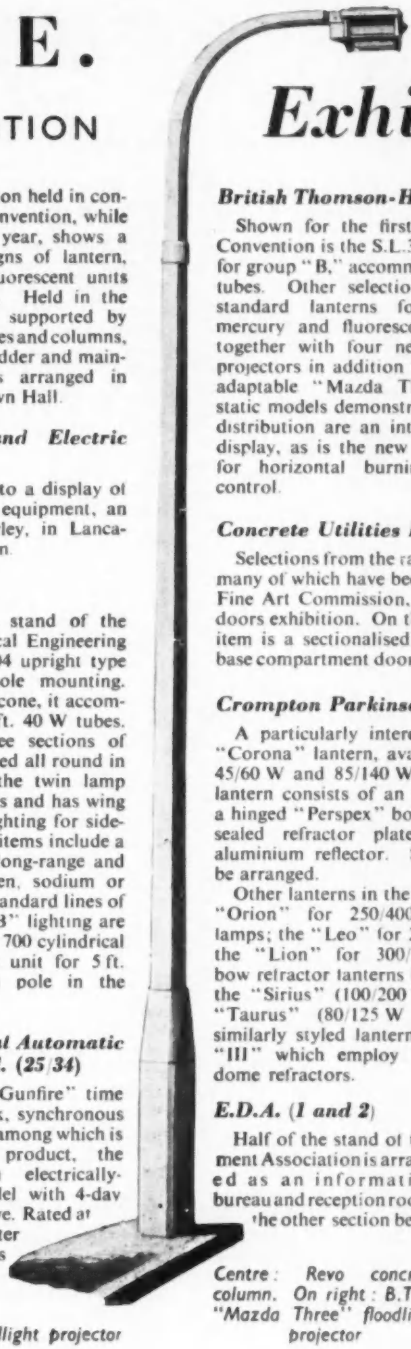
B.L.E.E.C.O. (36)

Of special interest on the stand of the Brighton Lighting and Electrical Engineering Co., Ltd., is their new No. 704 upright type fluorescent unit for top-of-pole mounting. In shape an inverted truncated cone, it accommodates either two or four 2 ft. 40 W tubes. The unit is glazed with three sections of "Perspex" sheet, opal being used all round in the four-lamp model, while the twin lamp uses clear sheet for two sections and has wing reflectors to give directional lighting for side-of-road mounting. Other new items include a series of flood-light units for long-range and close-up working with tungsten, sodium or mercury lamps. In addition, standard lines of street lanterns for "A" and "B" lighting are shown, as well as a new Model 700 cylindrical pole-top mounting fluorescent unit for 5 ft. lamps shown on a Stanton pole in the outdoor exhibition.

British, Foreign & Colonial Automatic Light Controlling Co. Ltd. (25/34)

A representative range of "Gunfire" time switches is shown in clockwork, synchronous and electrically wound models, among which is the latest product, the EW.10, an electrically-wound model with 4-day spring reserve. Rated at 10 amp, a water tight casing is supplied as standard.

"Bleeco" floodlight projector



Exhibition

British Thomson-Houston Co. Ltd. (17)

Shown for the first time at an A.P.L.E. Convention is the S.L.3500 fluorescent lantern for group "B," accommodating two 2 ft. 40 W tubes. Other selections from the range of standard lanterns for tungsten, sodium, mercury and fluorescent lamps are shown, together with four new types of floodlight projectors in addition to the well-known and adaptable "Mazda Three." Working and static models demonstrating light control and distribution are an interesting feature of the display, as is the new MA/W mercury lamp for horizontal burning without magnetic control.

Concrete Utilities Ltd. (27)

Selections from the range of standard pillars, many of which have been passed by the Royal Fine Art Commission, are shown in the outdoors exhibition. On the stand, an interesting item is a sectionalised specimen of the new base compartment door lock.

Crompton Parkinson, Ltd. (30)

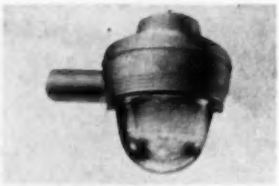
A particularly interesting unit is the new "Corona" lantern, available in two sizes for 45/60 W and 85/140 W sodium lamps. This lantern consists of an alloy top casting with a hinged "Perspex" bowl having hermetically sealed refractor plates, and an anodised aluminium reflector. Side or top entry can be arranged.

Other lanterns in the standard range are the "Orion" for 250/400 horizontal mercury lamps; the "Leo" for 250/400 vertical lamps; the "Lion" for 300/500 W tungsten; two bow refractor lanterns for Group "B" roads; the "Sirius" (100/200 W tungsten); and the "Taurus" (80/125 W mercury); and two similarly styled lanterns, the "Stella I" and "III" which employ single-piece prismatic dome refractors.

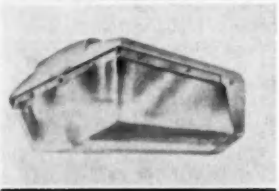
E.D.A. (1 and 2)

Half of the stand of the Electrical Development Association is arranged as an information bureau and reception room, the other section being

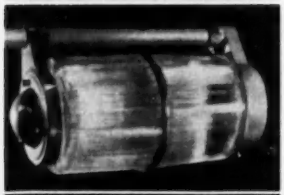
Centre: Revo concrete column. On right: B.T.H. "Mazda Three" floodlight projector



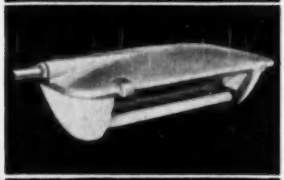
Ediswan C.S.12



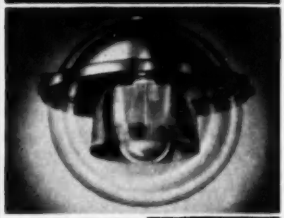
Ediswan S.S.B.1



Holophane cylindrical sodium refractor lantern



Siemens "Wilton-Sieray"



Metrovick S.S.51

Left: Revo fluorescent decorative lantern A.O.28212/1

Right: Holophane ornamental pedestal reflector 4446

devoted to a selection of street lighting photographs. A panel features the new E.D.A. booklet, "Fluorescent Street Lighting," recently published.

Edison Swan Electric Co., Ltd. (*31*)

A completely new range of street lighting equipment is being launched, which covers tungsten, sodium and mercury field. Styled by leading industrial designers, the initial range covers some 21 different lantern/glassware combinations.

Falk Stadelmann and Co., Ltd. (*11*)

Chief items of interest are the new "Fulmar" I and II sodium lanterns for Group A and B roads respectively, the former being suitable for 85/140 W lamps, and the latter for 45/60 W lamps. Both are open type, with alloy canopy, and have "Perspex" refractor plates with enclosed prisms. Model I is arranged for side entry and the Model II for top entry.

A representative range of standard lanterns is also shown.

General Electric Co., Ltd. (*6*)

An interesting feature of the stand is a display showing the evolution of a lantern design from the first stages to the finished product. A new design is a four-lamp vertical fluorescent for pole-top mounting. Of imposing dimensions, it houses four 5 ft. tubes inside a fluted "Perspex" enclosure. Other new designs include two variations on the "Three-Eighty" lantern, for two 5 ft. tubes and two 2 ft. tubes with light control by "Perspex" refractor plates giving an appearance of uniform flashing from all angles of view up to 80° from the vertical.

Other exhibits include a new open-type sodium lantern, in addition to totally enclosed patterns, and two mercury lamps, the "Viatron" and "Universal Dioptrion," which have tapped magnetic deflectors so that 250 or 400 W lamps can be used by changing one internal connection. A post-top lantern for side roads, promenade and balustrade lighting, the Z.5640, is also shown.

Holophane Ltd. (*32*)

An ingenious design is the cylindrical refractor lantern for sodium lamps, in which the refractor assembly can be rotated about the horizontal axis, thus adjusting main beams to correspond with road gradients. Other new items are the pole-top unit for 100-200 W G.L.S. or equivalent mercury and blended lamps, and the ornamental pedestal refractor for 300-750 W G.L.S. lamps, designed for promenades, parks and exhibitions. A representative range of other street lighting units and standard refractors is also shown.

Horstmann Gear Co., Ltd. (*34 and 35*)

A representative range of standard time-switches of hand, electrically wound, and synchronous types up to 50 amp. a.c., or 25 amp. d.c., includes the K/I, a model which incorporates solar and handset dials, thus allowing a number of secondary switching operations to be performed

during the solar "On" period. The latest model H.B.E., electrically wound switch with spring reserve, is also on show.

Metropolitan-Vickers, Ltd.

A top-entry version of the "S.O. Fifty" sodium lantern heads the list of new developments, the canopy being fitted with a central boss which also forms the lampholder and lamp support. The "S.S.51" is another new lantern, developed for Group "B" roads, with glass or "Perspex" bowl and refractors for symmetrical, axial, or non-axial distribution. The "Borough" lantern, for two 2 ft. fluorescent tubes suitable for Group "B" roads, is another recent development.

***Philips Electrical, Ltd.* (*14*)**

Exhibit mainly consists of a selection from the range of tungsten, fluorescent, blended, mercury, and sodium lamps. The "Westbury" pendant fitting, the "Apsley" and "Abingdon" fluorescent fittings, and the "Reigate" sodium floodlight fittings are also shown, together with an enlarged model of a starter switch and a display of transparencies of public lighting installations.

***Poles Ltd.* (*41*)**

Principal display is in the outdoor section where the "Adastra" range of galvanised sectional steel poles is displayed in tapering hexagonal and circular sections, nesting for ease of transport into a space no larger than the base section.

***Revo Electric Co., Ltd.* (*5*)**

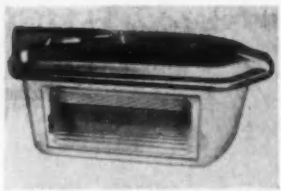
The well-known "Sol-etern" range of fluorescent lanterns is represented by the three-lamp model (for 5 ft. tubes) and, for Group "B" roads, by the "Baby Sol-etern" for two 80 or 40 W tubes. Group "A" roads are further catered for by the "Silverblue" lantern for 250/400 W mercury lamps and the "Silvergold" for 140 W sodium lamps, while for Group "B" roads the C.12422 and C.12421 and the C.13222 are shown. A decorative lantern for vertical mounting of two or four 2 ft. fluorescent tubes, the A.O.28212/1, is a new design which eliminates shadow round the base of the column. Floodlight fittings and the new illuminated bollard, in either stove or vitreous enamelled finish, are also on view.

In the outdoor exhibition artificial stone, steel, and cast-iron columns, and the "Festival," a new C.I. column, are displayed.

***Sangamo Weston, Ltd.* (*39 and 40*)**

A full range of synchronous time-switches includes the S.S.G. solar dial type with additional fitment for operation between sunset and sunrise, and a model suitable for use with multiple lanterns for switching out lamps at predetermined times to reduce illumination levels between, say, midnight and sunrise.

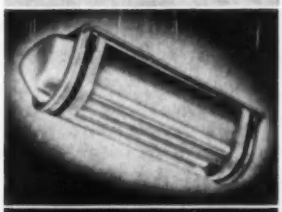
Watthour meters of single, double and three-element patterns, portable test meters, transformers and metering accessories, are shown, together with a range of Weston instruments including photo-electric photometers.



Crompton Corona I

Revo Silverblue C.12628

Revo Baby Sol-etern

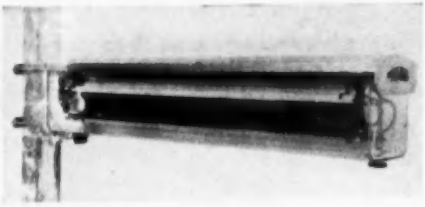


Metrovick "Borough" lantern

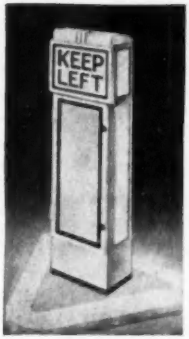
Metrovick S.O. Fifty

Left: Holophane post top unit 2/44/50

Right: Bleeco upright fluorescent lantern for two 2 ft. 40 W lamps

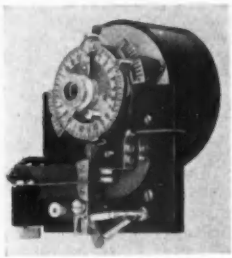


Left: Siemens' Wilton-Sieray 3/4 80 fluorescent lantern



Above: Revo illuminated bollard

Above Right: B.T.H. S.L.3500 for Class B roads



Right: Venner type M.S.D.C. single pole time switch

Siemens Electric Lamps and Supplies, Ltd. (37-8)

This exhibit includes a completely new design of the "Wilton-Sieray 3/4/80" lantern for Group "A" roads, in which some three-quarters of the weight, including chokes, instant-start transformers, etc., is carried in the head of the lantern, thus being carried by the pole and not the cantilever. Control gear is readily accessible without removing the "Birmabright" reflectors, and other features include a pivoted "Perspex" bowl secured by one large fixing, and a safety switch for disconnection during maintenance.

Two examples of the small Wilton-Sieray 2/40 lantern, housing two 2 ft tubes for Group "B" roads are shown, one being standard pattern with side mounting and one with cradle bracket. Other exhibits include the Newton-Sieray Minor lantern, a selection of lamps including a colour display, and a number of typical floodlighting units.

Stanton Ironworks Ltd. (15)

Designs featured this year have been approved by the Royal Fine Arts Commission. Outdoors, four Class A and four Class B columns are shown, while the stand is devoted to a base section of a concrete pole in addition to a display of models and photographs.

The new G.E.C. four-lamp vertical fluorescent lantern

Stewarts and Lloyds, Ltd. (9 and 10)

Exhibited in the Outdoor section are four main types of tubular steel columns, including bracket-arm and shepherd's-crook types, for main traffic routes at 25 ft mounting height. Swan-neck (15 ft) and pillar (13 ft) types for Class "B" roads are also shown. On the stand in the Conference Hall exhibition are shown a range of steel tubes to B.S.1387, examples of glass tissue wrapping, welding fittings, a section of a standard column showing the door mounting, and a number of colour transparencies.

Thorn Electrical Industries, Ltd. (3)

With the Festival in mind, a part of the stand is being devoted to colour floodlighting. Central exhibit is a miniature theatre demonstrating dimming of fluorescent lamps as used at Covent Garden, and the main lighting of the stand is from two W.49 outdoor floodlighting units each housing three 5 ft tubes.

Street lighting is typified by the PLQ/3080 lantern, demonstrating quick-starting and stability over a wide range of voltage variation, together with a display of photographs of fluorescent and tungsten installations.

Venner Time Switches, Ltd.

Among the selection of time switches for all street lighting applications, the M.S.D.C. is of particular interest. Used for fluorescent lighting, it will switch off a proportion of the tubes at midnight (or other set time) leaving the remainder till sunrise, or, where used for controlling main and subsidiary lighting, it will effect the desired combination of switching, allowing time for the "warm-up" period of sodium and mercury lamps. There is, in addition, a range of standard boxes for street lighting use.

Problems and Practice

IN ENGINEERING

Redundant Conductor

AN automatic 2-panel stator/rotor contactor gear, controlling two small 400 V, 3-phase motors was reported faulty. No. 1 motor had stopped due to blowing of "blue" line fuse in No. 1 t.p. switch fuse. This fuse had been replaced, but the motor would not start due to another blown fuse, X1, also in the "blue" line. After replacing this fuse and closing No. 1 t.p. switch fuse, the contactor gear operated, but immediately blew the main fuse in "blue" line of No. 1 t.p. switch fuse. Not only did this happen, but No. 2 panel contactor gear opened and shut down No. 2 motor. It was found that the X2 fuse in the "blue" line of No. 2 panel had blown. The actual cause of the main fuse in No. 1 t.p. switch blowing was due to an earth fault on one of the motor lines (blue). After clearing this fault and attending to the faulty fuses, both motors were found to be working normally.

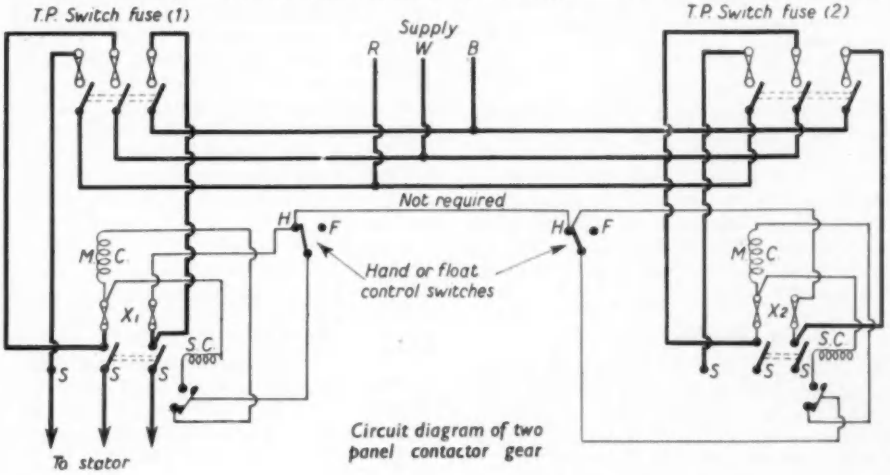
Not being satisfied as to the cause of the X1 and X2 fuses blowing, further enquiries were made of the attendant, who mentioned that if he wished to work on *either* of the contactor panels he had to open *both* main switch fuses, otherwise he was sure to receive an electric shock on touching some of the contacts. The whole of the wiring for both panels was examined and a diagram of connections drawn. On studying this diagram, not only was the reason for the "shock" disclosed but also why the contactor coils fuses X1 and X2 blew.

Referring to diagram: When the main fuse blew due to the earth fault on wiring to motor, there was an alternative feed from "blue" line fuse in No. 2 switch via X2 "blue" line fuse and X1 "blue" line fuse back to earth.

Apparently, X1 fuse was the weaker of the two and therefore blew. X2 fuse would, however, be considerably weakened and, on the third attempt at starting would, therefore, blow before X1 which had just been renewed. The makers had inadvertently added an extra and totally unnecessary conductor (marked "not required" in diagram) between "H" terminals in hand/float control switches. This conductor was, therefore, removed, since when no further "queries" have been raised. The gear had been in continuous use for over ten years and was exactly as received from the makers.—*E. A. Robbins.*

Another Demagnetiser

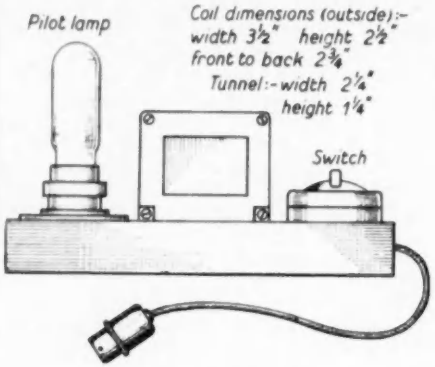
YOUR contributor, "C.W." (July 13 issue), is very fortunate if he is able completely to demagnetise small clock parts by means of the demagnetiser described. A test with a compass needle would almost certainly show that the parts in question had retained a considerable



Circuit diagram of two panel contactor gear

degree of magnetism. Possibly the degree of demagnetisation achieved proved sufficient for clock work.

Confronted with the need to demagnetise watch parts, and after trying the usual toolroom demagnetiser, a device as sketched was built. The former, built up from ·094 in. bakelite board, is wound with 36 s.w.g. enamelled copper wire, sufficient wire being used to give a safe current loading when used on 250 V,



A simple demagnetiser

single-phase, a.c. supply. After impregnation to render solid, and covering with a protective strip of leatheroid, the coil is secured to a wooden baseboard battened underneath to clear the wiring.

A 5-amp bakelite tumbler switch controls the supply, which is via twin flex terminating in a lampholder adaptor. A bakelite batten holder wired across the coil leads, holds a small 250 V pilot lamp, coloured to reduce glare. To eliminate stray magnetic fields, all fittings and screws are of non-magnetic metals.

In use, the magnetised watch parts are placed in a small cardboard box. The current is switched on, and the box passed through the coil tunnel. Without pausing, the box is drawn steadily away to a distance of approximately 18 in. Current is then switched off. In obstinate cases, several passes are necessary before the watch parts pass the compass needle test satisfactorily.—*F. S.*

Variable Speed Motor Trouble

A 30/10 H.P. 400 V 1080/360 r.p.m. variable speed commutator motor driving a wheel lathe developed a breakdown in the insulation of the primary winding which necessitated the removal of the defective rotor for repairs. A spare rotor was fitted and the motor put back into service. After a short while on load it was observed that abnormal overheating of the secondary winding was taking place. With the motor running at the lowest speed (360 r.p.m.) the current of the secondary winding was checked by means of a "tong tester" and found to be considerably in excess of the normal loading. To correct this the brush rings were adjusted to increase the amount of regulation winding in series with the secondary until the normal current reading was obtained. The motor was then put back into service and no further complaint was received. From the foregoing incident it was apparent that the resistances of the regulation winding of both rotors were of different values.—*W. Gatehouse.*

Interference with Starters

ALL too often it seems that consumers look upon starters as a necessary evil, rather than as a means of protecting their equipment.

There was the case of the machinist in a joinery works who proudly displayed a remedy for preventing the handle of the starter for his machine flying "off". This was a small wooden wedge shaped to fit in the front of his starter in such a manner as to prevent the "no volt" release tripping. Cases of handles of starters being tied in the "on" position or incorrect setting of overload devices, are all too frequent examples of misuse.

On one occasion a 30 h.p., 3-phase contactor starter failed to protect its motor and upon investigation it was found that the motor had been single-phasing. A fuse eventually blowing luckily saved the motor from burning out. The overloads were of the coil with oil dashpot type and their setting appeared to be in order. However, it was impossible to lift them manually except by abnormal pressure. The dashpots were removed and found to be filled with heavy lubricating oil. These were cleaned out and filled with the correct viscosity dashpot oil, making the starter properly serviceable once again.—*S. Arnold.*

Water Level Warning

IN the article which appeared under this title in our issue of 7th September, there is an incorrect connection shown in the circuit diagram. The line from the coil of bell "B" to the lead for the lower water contact should, of course, be omitted, as it effectively shorts out bell "A".

Contributions to this page dealing with specific items of interest to electrical engineers and maintenance men are welcome, and, if accepted, will be paid for at our standard rates. Contributions should be written on one side of the paper only and may be accompanied by sketches, which will be re-drawn for publication.

Notes on Wiring
by MEGOHM

Horizontal and Vertical Ducts

Co-operation and Collaboration

IN spite of the excellent advice contained in the various Codes of Practice and disseminated by others, to the effect that when installations in new premises are planned there should be early, full and progressive co-operation and collaboration between the architect, the electrical engineer and all other interests concerned, I am afraid that we still have some way to go before the underlying ideal is reached. Probably part of the reason for our present shortcomings lies in the fact that very few, if indeed any, buildings are completed as originally planned.

Adequate Accommodation

Although the man working on a new building has troubles and discomforts enough of his own to leave him little time to consider the problems, which will subsequently beset his successor, the maintenance engineer or contractor, I would remind him that his forethought and ingenuity will do much to relieve those whose task it becomes to carry on where he left off.

A bone of contention will always be how much, and where, accommodation should be provided for the mains cable runs to the various distributing points in a large building. Space being at a premium in all large towns and cities, the buildings are frequently of peculiar shapes to suit the individual sites, which makes it difficult to obtain a balanced layout, or adequate space for vertical risers. In my experience an architect is usually quite prepared to put in false ceilings in corridors, etc., thus providing ample facilities for horizontal distribution, but it is very difficult to convince him that one must also feed from the basement to the top floor by some direct and adequate route. This almost invariably means upsetting the symmetry of the floor plan and seems to be considered one of the major forms of sacrilege; and in the result we are offered, and usually accept, what is really quite inadequate accommodation.

I recently came across a case where so-called duct space had been provided, by allocating 2 ft of wall space by the corner of a room and 18 in. on the return wall, this applying through the corresponding rooms right up the building.

In this space had been run a number of conduits, l.c. and a. cables, metal trunking, etc., and on each floor two main switches and two sub-boards completed the arrangement. After, repeat *after*, this had all been neatly arranged the "duct" was formed by building out an 18 in. partition and enclosing the front by means of a narrow door at the bottom, and plaster-work at the top.

It cannot be said that the original work was other than a first-class workmanlike job, and would remain so had it been left open and accessible. As it now is, it is impossible to dismantle the conduit or carry out any alterations or additions without first breaking down part of the structural work, and even casual maintenance or fuse replacements are difficult, due to the cramped and restrictive enclosure.

I also noticed that the openings through the floors had been run in solid with concrete, and although this conforms to regulations, the underlying principle is that the resistance to fire shall not be less than that of the surrounding structure, and other materials of less mechanical strength can be equally suitable. There is, in fact, a Code of Practice dealing with this.

False Ceilings

For the horizontal runs I favour those formed in false ceilings in preference to floor ducts or floor traps, as the former are almost invariably shared with the hot-water fitter and the latter are liable to become filled with water or are lost under furniture or floor coverings.

Here again adequate space must be provided with ample access for repairs or any work subsequently found to be necessary. Ease of access is equally important, for if a trapdoor or panel is secured by, say, two dozen screws, then it is a safe bet that less than half of these will ever be replaced once they have been removed.

Another oft neglected convenience is to provide one or more plug points inside a false ceiling for the useful accessory, the "wandering lead." If one uses a standard gauge iron-clad type with a captive screw-on cover it will be perfectly safe—infinitely more so than the usual candlestump fixed in an empty bottle.

overseas news

Russian Scheme

A further irrigation and power scheme has been announced from Moscow. Apparently it is planned to reclaim most of the 110,000 square miles of the Kara Kum Desert with an irrigation system fed by a 650-mile-long "Grand Turkmen" canal running eastwards from the Caspian Sea to the Amu Darya River. The project, which is to be started next year and will be ready by 1958, also calls for the construction of three large dams with a hydro-electric capacity of 100,000 kW.

Plant for Richmond

Richmond power station, Victoria, one of the oldest in Australia, is to be modernised by the State Electricity Commission. Originally owned by the Melbourne Electric Supply Co., it was taken over by the commission early in the 1920s. Although designed to meet local industrial requirements, the plant has been used as a peak-load station in recent years. New generators and turbines ordered recently from England and Switzerland will be installed. They comprise a 38,000 kW generating set, together with oil-fired boilers, which will cost approximately £1,100,000. The first part of the shipment of plant is due to leave Europe in a few weeks. The new generator is scheduled to start operating with one of its two boilers in time to meet next winter's peak load, possibly by early July. Meanwhile the commission's workmen are preparing the site.

A New Queensland Bill

The handing over of regional electricity board assets to local authorities was advocated by Mr. Aikens in the Queensland State Parliament recently. He said the local authorities had built up electricity undertakings, and should be allowed to control them. In Townsville the Regional Electricity Board had wiped out all the things the City Council electricity department had done for the people, he considered. It had increased tariffs and failed to supply country people, he alleged. Mr. Aikens was speaking on a Bill to amend the State Electricity Acts and the Regional Electricity Acts.

Replying, the Mines Minister, Mr. Power, said that Mr. Aikens had made wild statements without any evidence. Regional electricity boards had full autonomy, subject to certain things which must be approved by the State Electricity Commission, and the boards were doing a good job. Introducing the Bill, Mr. Power said it provided for the appointment of one or two Deputy Commissioners for Electricity. This would strengthen the State Electricity Commission organisation. In the absence of the Commissioner the Deputy Commissioner would act in his place, and because of the tremendous expansion of electricity work the Governor-in-Council could appoint a second deputy director. The appointment would be for not more than seven years, its salary being fixed by the Governor-in-Council.

It was also proposed to increase the limit beyond which public tenders could be called by the commission from £100 to £250.

The Bill provides that if a regional electricity board fails to elect a chairman the Government would appoint one. If the chairman resigned, his successor would be nominated by the local authority but would not necessarily be chairman.

S.A. Expenditure

Loan estimates submitted to the South Australia Parliament recently provide for the record expenditure of £21 million—an increase of nearly 50% over the 1949-50 estimates. The biggest allocation—of £4,600,000—is for the development programme of the Electricity Trust of South Australia. This covers a full year's programme of development at Port Augusta regional powerhouse, a start on a new power station at Port Lincoln, expansion at Osborne "B" powerhouse, and construction of transmission and distribution lines from Port Augusta.

Brisbane Plans

The City Electric Light Co., Brisbane, plans to borrow £800,000 by an issue of debentures, to finance its development programme. This move is necessitated by the heavy outlay on the new power station at Gibson Island, the first stator for which arrived last month. It is hoped to have the station in operation by the winter of 1952.

Another Power Line

In connection with the scheme to construct three new diesel operated regional power stations at Mildura, Swan Hill and Shepparton, the State Electricity Commission of Victoria propose to erect a 350 mile long 220 kV power line linking the first two named stations to the rest of the Commission's system. This will enable electricity generated from brown coal in the Latrobe Valley to be transmitted when required, over a distance of nearly 600 miles. It is planned to complete the work by 1965. Estimated cost of the whole scheme is about £6,500,000. The Shepparton 15,000 kW diesel station is expected to be ready next year, and the 17,500 kW station at Mildura and the 15,000 kW plant at Swan Hill in 1953. The Commission is now negotiating to purchase the Mildura city council's electricity undertaking.

This development plan has been warmly received in the State, for under it, rural towns, irrigation areas and the Murray Valley's secondary

industries will be connected to the State's power supply. Power will be available to the State Rivers and Water Supply Commission to extend its pumping stations and open up more irrigation areas. For years, the commission has had to generate its own power at these stations.

Incidentally, the State Government last week imposed a ban on the introduction of new industries in the Melbourne Metropolitan area. The Premier, Mr. McDonald, said it was considered strategically unsound further to concentrate industry in Melbourne. It was more imperative to send industry to the country.

C.S.A. Now Independent

With the purchase of its own buildings in Florence Street, Toronto, the reorganisation and independent operation of the Approval Division of the Canadian Standards Association is completed, the Association has announced. Previously the C.S.A. was connected with the Hydro-Electric Power Commission of Ontario. The administrative and engineering staff and the laboratories of the C.S.A. Approvals Division, both electrical and fire hazards branches, will be located at the new headquarters, which is a modern three-storey building with approximately 20,000 sq ft of floor space. It is anticipated that the reorganisation will result in improved efficiency in the approvals work.

A Call for Economy

In spite of the big increase in generating capacity, there is now still need to economise in electricity consumption, Mr. R. H. Saunders, chairman of the Hydro-Electric Power Commission of Ontario, has stated. In the last two weeks of August, the industrialised Niagara area alone took 2,000,000 kWh more than in the same period last year. Today, there were more than 12,000 manufacturing concerns in the Province, while the population was in excess of 4,500,000—an increase of over 200,000 in the past two years. There was also tremendous activity in home building. In 1948 a total of 26,391 new homes were constructed in Ontario, and in 1949 the figure was 31,440. New industries, new homes and more people all mean greater demands for power, he pointed out. Before the end of the year, the Commission would have two more 45 MW units, possibly four, in operation at Des Joachims, and two 30 MW sets at Chenaux.

Damodar Project

Estimated expenditure by the Damodar Valley Corporation for the year 1950-51 is Rs 92·7 million. About Rs 90 million were spent on the project up to May 31 last. The Corporation have appointed a board of consultants consisting of Mr. Happer, former chief engineer of the Bureau of Reclamation of America, Mr. Venkatachari, chief engineer of the Government of Madras, and Mr. Harja, of a well-known U.S. engineering firm. The consultants were to formulate an overall plan for the development of the Damodar river system so as to make the optimum utilisation and allocation of water resources, to decide the order of priority of construction of various works, to advise on detailed designs, specifications and purchase of equipments, construction contract and construction operations.

Railway Electrification

Expenditure amounting to £1,528,385 in the current financial year for improving and electrifying railway lines in the Hutt Valley has been approved by the New Zealand Cabinet. It is estimated the eastern line will be electrified to Taita by the middle of 1952, and as far as Upper Hutt in the following year. Provision for increased capital expenditure this year on electric supply schemes, with a total of £7 million to be spent from loan funds, was also indicated by Mr. Holland in his Budget address.

N.Z. Power Shortage

The power position had never been worse, and unless abnormal rains fall before next summer, conditions next year would be much more serious, declared Mr. C. J. Lovegrove, chairman of the Auckland (N.Z.) Electric Power Board, recently. According to Mr. A. E. Davenport, general manager of the State Hydro-Electric Department, consumers in the North Island had used 13·27% above their allocation in recent weeks. The position in the South Island was more satisfactory, although here power consumption for the last week of August was 3·9% above the allocation.

Meter Problems

Losses caused by faulty electricity meters were referred to by Mr. J. A. Mathews, A.M.I.E.E., electrical engineer to the Uitenhage Town Council, at its recent meeting. He said that of the 3,800 meters in use only 1,400 had been inspected and tested by his department. The remainder would be checked in the near future, but it was obvious that after 20 years' service many of the meters were not being favourable to the Council.

A Power Warning

A warning of the need to reduce electric power consumption during peak periods has been sent by the Electricity Supply Commission of South Africa's Rand Undertaking to all its consumers. They include secondary industry and Reef municipalities, but not Johannesburg. It is stated that providing all generating plant remains in service a reduction of 5% in kW used by every consumer will probably avert power cuts, but a reduction of 10% to 20% will become necessary to effect similar relief from 1951 to 1954.

Development Scheme

A meeting of Kroonstad municipal ratepayers was called earlier this month to approve the raising of a loan of £150,000 for extensions to the town's power station generating plant and electricity distribution system.

PERSONALITIES IN THE INDUSTRY

Following the retirement of **Mr. P. J. Burgess,** A.M.I.E.E., A.M.I.Mech.E., from the position of power station superintendent at Nechells generating station, Midlands Division, **Mr. G. D. Clegg,** A.M.I.E.E., has been appointed to the post. For some time past he has been deputy station superintendent there, having originally joined the Birmingham Corporation electricity undertaking as a junior engineer, later successively holding the posts of shift charge engineer, system control engineer, and boilerhouse superintendent. Mr. Clegg gained his technical education at Rochdale and Burnley Technical Schools, Manchester School of Technology and Birmingham Central Technical College. He later served with the Heywood, Newport, Burnley, Stockton and Kilmarnock electricity undertakings. Mr. Clegg has been a member of the District Joint Advisory Council since its inception, and is chairman of the No. 9 Birmingham Generation Group local advisory committee.

Mr. G. D. Clegg

At an informal gathering held in the Langport offices of the South Western Electricity Board recently, members of the local staff, with Mr. H. D. Weeks (Taunton district manager) and Mr. Martin (engineer in charge), joined to wish goodbye to **Mr. A. B. Wightman,** local manager, who was retiring after 38 years' service with the Board and its predecessors, Christy Bros., and the North Somerset Electric Supply Co. Mr. Wightman is succeeded by **Mr. F. Tilsley,** who was previously at Torquay.

The following staff changes have been made in connection with the Barnstaple district of the South-Western Electricity Board: **Mr. F. E. Pitt,** A.M.I.E.E., district engineer under Mr. R. Robinson, has resigned, and his place has been taken by **Mr. T. Brookhouse,** A.M.I.E.E., branch manager at Lynton and Lynmouth; and **Mr. A. R. Taylor,** of Oakham, Rutland, has been appointed to succeed Mr. Brookhouse at Lynton and Lynmouth; he took up his duties this week.

By an unfortunate typographical error, the initials of **Mr. H. de C. Falle,** of Aberdare Cables Ltd., were wrongly given in our issue of September 7. The correct version is as above.

T.M.C.-Harwell (Sales) Ltd. have appointed **Mr. A. G. Steers** to represent them in Lancashire, Cheshire and North Wales, and **Mr. R. C. Betts** in Yorkshire and North Lincolnshire.

Mr. H. A. R. Binney, C.B., an Under-Secretary of the Board of Trade, has been appointed Deputy Director of the British Standards Institution. He takes up duties next month.

Mr. J. P. Elliot, secretary and chief accountant of Davey, Paxman and Co. Ltd., has been appointed to the Board of the company.

Mr. B. H. Binder and **Sir Reginald Leeper,** of London, and **Senor Juan Martinez,** of Mexico City, have been elected to the Board of the Mexican Light and Power Co. Ltd.

The Government's intention to proceed with the nationalisation of the iron and steel industry was announced last Thursday. Nominated as chairman of the Iron and Steel Corporation of Gt. Britain (to give it the full title) is **Mr. S. J. L. Hardie,** D.S.O., LL.D., who is now chairman of the British Oxygen Co. Ltd., vice-chairman of Metal Industries Ltd., and a director of several other industrial undertakings. The deputy chairman will be **Sir John Green,** a director of Thomas Firth and John Brown Ltd., and chairman of the central conference of the Engineering and Allied Employers' National Federation. The full-time members are to be: **Sir Vaughan Berry,** British delegate to the International Authority for the Ruhr, member of the London Discount Market, 1925-45; **Gen. Sir James Steele,** Adjutant-General to the Forces; and **Mr. W. H. Stokes,** senior official of the Amalgamated Engineering Union. The part-time members will be: **Mr. J. W. Garton,** chairman and financial controller of Brown Bayley's Steel Works, and managing director of the Hoffmann Manufacturing Co., and **Mr. R. A. Maclean,** chairman of A. F. Stoddard and Co., director of Scottish Industrial Estates and a number of other commercial concerns. These appointments have effect from October 2. Vesting date will be January 1, 1951, or soon afterwards. Mr. Maclean has since retracted his acceptance of nomination as a part time-member.

Mr. S. J. L. Hardie

His many friends will be glad to hear that **Mr. J. Holland,** assistant chief engineer (traction) of British Insulated Callender's Cables Ltd., is now making satisfactory progress in the Warrington Royal Infirmary Private Nursing Home following upon a recent motoring accident.

This month saw the retirement of **Major F. Barritt Hills,** D.S.O., who has been engineer and manager of the State of Guernsey Electricity Department for a number of years. His successor is **Mr. I. F. Young,** A.M.I.E.E., as we noted in our June 1 issue.

Mr. P. C. G. Burton, of Battersea, S.W.11, has been appointed a meter superintendent with the Central Electricity Undertakings, Nigeria. Born at Sutton, and educated at St. Bede's School, Eastbourne, and at Sevenoaks School, he has been a meter tester for some years. During the war, he was a wireless mechanic in the R.A.F.

In charge of agricultural development work of the Southern Electricity Board for nearly two years, **Mr. H. R. J. Baigent,** M.I.E.E., A.M.I.I.A., has now been appointed as section head (sales and development) in the chief commercial officer's department of the Board. Mr. Baigent has for long been associated with the area, being district manager with the Wessex Electricity Co. Ltd. prior to vesting day, gaining considerable experience in rural electrification work. Previously he was engineer and manager to the Thames Valley Electric Supply Company Ltd.

Mr. H. R. J. Baigent

The position of power station superintendent at the Agecroft generating station, North-Western Division, B.E.A., is to be filled by **Mr. Harry Greenwood,** A.M.I.E.E., A.M.I.M.ch.E., who now occupies a similar post at the Wolverhampton station, Midlands Division. Educated at Barnsley High School and King Edward VII School, Sheffield, he continued his studies at the Manchester College of Technology, Salford Royal Technical College, and Sheffield University, and served an apprenticeship with the Metropolitan-Vickers Electrical Co., Ltd. From 1931 to 1939 he was charge engineer at Padiham power station of the Lancashire Electric Power Co., Ltd. He has also served with the Great Yarmouth and Kingston-upon-Hull Corporation Electricity Departments.

Mr. H. Greenwood

At present station superintendent at Fulham generating station, **Mr. W. T. Bamford,** B.Sc.(Eng), A.M.Inst.C.E., A.M.I.Mech.E., has been nominated group generation engineer (operation), No. 1 group of the London Division of the B.E.A. After taking his degree at University College, he served with the British Thomson-Houston Co. Ltd. as a student apprentice. He joined the London Power Co. Ltd. in 1925, and, following service at the Deptford and Battersea power stations, became chief assistant engineer at the Acton Lane station at vesting date, subsequently taking up his present position at Fulham.

Mr. W. T. Bamford

A presentation of a pen and pencil was made to **Mr. H. J. Burdett,** of Johnson's Electricians, Carver Street, Sheffield, in recognition of his 40 years as a member of the Sheffield branch of the Electrical Contractors' Association. The presentation was made by **Mr. J. W. Chadwick,** of T. W. Sampson and Co. Ltd., the branch chairman.

OBITUARY

The death occurred on September 6 of **Mr. F. A. Crosse,** formerly manager of the Maxlume Lighting Section of Veritys, Ltd., London office.

We note the death, on September 17, of **Mr. J. Young,** aged 66, formerly charge shift engineer at Pinkston power station of the Glasgow Corporation, Transport Department.

The death occurred recently, whilst on holiday in Belgium, of **Mr. C. H. Champion,** A.M.I.E.E., M.I.Mech.E., F.R.P.S., aged 64, chairman of Charles H. Champion and Co. Ltd. and the Ship Carbon Co. of Gt. Britain Ltd., of which companies he was the founder. Earlier he had spent some years with the Langdon-Davies Motor Co. Ltd., Harper Bros. and Co., consulting engineers, and the Union Electric Co., going to the U.S.A. in 1912 as technical manager of the American branch of the latter concern. It was shortly after his return to this country in 1921 that he founded the two carbon firms.

WILLS.—**Mr. C. F. Crymble,** A.M.I.E.E., lecturer in electrical engineering at King's College, Newcastle-upon-Tyne, left £3,794 gross (£2,289 net value).

Mr. A. P. MacAlister, M.I.E.E., former borough electrical engineer of Islington, left £10,494 gross (£10,407 net value).

Mr. E. Ll. Ingram, M.I.E.E., a former chief engineer of the Bournemouth and Poole Electricity Supply Co. Ltd., left £2,532 gross (£2,468 net value).

BIGGER DEMAND ON E.I.B.A.

"THE further expansion of the electrical industry in the Government's armament programme and the consequent increase of personnel in the industry is going to mean an increased demand on the Association," said Mr. E. C. Holroyde, president of E.I.B.A. at the Association's annual meeting in London on Friday. In his opening address Mr. Holroyde said that 1949 was the first year that they had felt the impact of National Insurance, and remarked that the Association had had to pay out considerably less in beneficiaries.

"But the number of beneficiaries is increasing and one foresees that demands are going to climb. Because of national provisions, people have thought that E.I.B.A. will need less money, but besides the increase in beneficiaries, the Association will be spending more on social service work," said the president.

He concluded by saying there were still far too many people who did not know of E.I.B.A. and impressed on the meeting the need "to talk E.I.B.A. on every possible occasion."

Mr. Holroyde was re-elected president for a second year and Mr. L. C. Sharp, who celebrates the silver jubilee of his service to E.I.B.A. in three months' time, was re-elected chairman of the court.

Chairman of the Finance Committee, Mr. H. A. Deacon, gave good news when he announced a surplus of £2,733, which compared very favourably with a deficit of over £3,000 the previous year. He echoed the president's words when he said: "we have saved £1,693 in amounts paid out to beneficiaries, but this is no continuing easement of the Finance Committee's problems because the amount we are spending in 1950 has jumped again." Mr. Deacon added that, although the amount paid out had fallen, the cases dealt with had increased to 455 compared with 398 in 1948.

Mr. Victor Watlington had a word to say about Broome Park which he called an "investment" and logically commented that if the people at the Park were not there they would have received an allowance from some other source.

The Electrical Industries Ball will again be held on the second Friday in November (November 10) at Grosvenor House. Tickets can be obtained from E.I.B.A. at 32 Old Burlington St., W.1. Balls are also to be held at Cheltenham, Exeter, Reading and Brighton during October. Birmingham Carnival is on October 6 and Glasgow's dinner dance on the 17th while Stoke-on-Trent's first annual ball takes place on November 24.

Price Index for Electrical Materials

IN 1935, the first Board of Trade Index of wholesale prices were published; since that date, however, a need has been felt for an index with a wider scope and one from which a considerable number of sub-indices could be derived. This would prove useful generally to those engaged in trade estimations in the Government, industry and the economic sphere. In consequence, a revision of the original index is in course of preparation of which the first set of sub-indices for the electrical machinery industry are already available. This work has been much aided by the 1948 Census of Production.

The figures given in the accompanying tables cover the electrical machinery industry as defined in the Standard Industrial Classification and the weights used are based on information obtained from the 1948 Census of Production.

June 30, 1948, is the date adopted for the base of the index and the method of calculation has been to multiply the price-relatives for the selected commodities (the price relatives are the ratios between the price for each listed period compared with the corresponding figures for June 30, 1949) by "weights" determined by calculating the proportions by value of each commodity (or group of commodities imputed to it) in the 1948 Census, as given in the table below. At the request of the electrical industry figures have been given back to 1945.

Principal Materials and Weight Values

Electrical sheet	15.7
Foundry pig iron	13.5
Steel ingots (non-alloy)	7.8
Alloy steel bars	7.6
Brass ingots 60/40	6.5
Heavy steel plates	4.7
Electro-ceramics	4.1
Aluminium ingots	3.8
Copper H.C. electro	3.6
Mica board	3.2
Copper, cold rolled strip	3.0
Copper sheet	3.0
20 other materials	25.5

Table I.—Price Index Numbers of Materials of the Electrical Machinery Industry. June 30, 1949 = 100

	Jan.	Feb.	March	April	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Yearly av.
1945	74.2	74.5	74.0	73.8	73.9	74.0	74.3	74.7	74.7	74.8	74.8	75.9	74.5
1946	78.5	78.7	78.6	79.5	80.0	80.1	83.6	84.2	85.1	85.2	86.6	88.9	82.4
1947	93.6	94.4	95.7	98.5	98.4	98.2	97.4	96.6	96.7	99.1	99.3	99.7	97.3
1948	101.7	102.3	102.3	102.3	102.3	101.1	101.1	100.4	100.3	102.5	103.0	103.2	101.9
1949	103.6	103.1	102.2	105.8	103.8	101.5	99.1	99.5	102.5	108.6	109.5	108.9	104.0
1950	109.4	109.6	109.4	111.3	115.0	118.6	120.7	122.5					

Electricity at the Commercial Motor Show

Earl's Court, London, 22-30 September

AS might be expected the application of electricity in the commercial motor transport world increases yearly.

The applications are many and are now well known, but it is interesting to note that one firm famous pre-war for their electric vehicles, has this year returned to the building of these vehicles.

Partridge Wilson and Co. Ltd., is the firm in question; their new 1950 range comprises the popular Wilson Electric "Major" chassis fitted with coach-built bodies suitable for the delivery of provisions.

Included are four-speed contactor type controllers relay operated by patent Wilson pre-selected delay master unit.

Whilst on the subject of electric vehicles, attention must be paid to the exhibits of Smiths Electric Vehicles Ltd. and Hindle Smart and Co. Ltd. Smiths are makers of the famous N.C.B. electric vehicle. In addition to their standard 1 ton and 30 cwt. models the firm is showing two mobile shops for inside service. Hindle Smart, makers of "Helecs" vehicles, are showing the "Intruder," an improved design which breaks tradition by its deviation from the boxed appearance associated with electric vehicles.

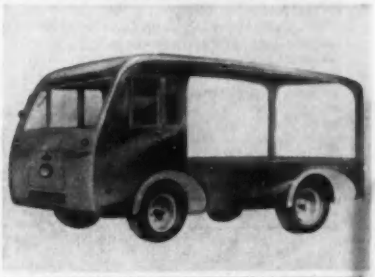
Tilling Stevens show a battery electric chassis type C.E.V. upon which is mounted an alloy refuse-collecting body by Glover, Liversage and Webb.

Trolley buses and trolley bus equipment is also featured. The Sunbeam Trolleybus Co. Ltd., are featuring two chassis and three complete trolleybuses. Equipment for trolleybuses is exhibited by Crompton Parkinson, English Electric and Metropolitan Vickers. Much of this equipment is seen fitted to vehicles exhibited on the stand of British United Traction Ltd.

Principal amongst the exhibitors of garage electric servicing equipment are the General Electric Co., Wolf Tools, Black and Decker Ltd., Streamline Filters, H.E.C. Compressors and Engines Ltd., and B.E.N. Patents.

The ignition and car electrical systems are well serviced by many firms. Most interesting displays are those of James Neale and Sons, C.A.V. Ltd., Brown Brothers, Trico Folberth, Wilmot-Breeden Ltd. and Rists Wires and Cables. Batteries of all sizes are shown by Chloride Batteries, Peto and Radford.

Top right: The N.C.B. Electric 2-ton travelling grocer's shop built by Smiths Electric Vehicles Ltd.



The Helecs Intruder by Hindle Smart and Co. Ltd., breaks tradition by its construction

Wilmot Breeden's dual beam "Luminator" Lamp for carriage roofs

Davenset Model D battery charger for a.c. mains, output 16 V at 6 amps by Partridge Wilson Ltd.

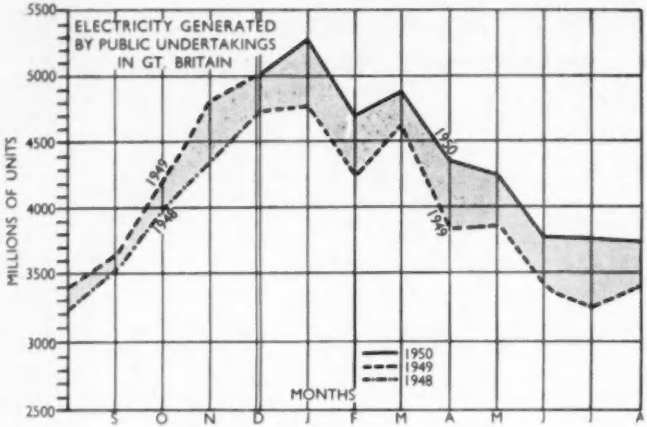
H.E.C. compressor Model C10XP by H.E.C. Compressors and Engines Ltd.

Units Generated

3,742 million units was the total energy generated during August, 1950, in stations under the control of the B.E.A., the North of Scotland H.E. Board, and the Lochaber Power Co. The corresponding figure last year was 3,443 million, so there has been an increase of 8.5%.

Of the total, 3,609 million units was generated in steam stations and 117 million in hydro-electric.

Energy sent out during the month was 3,528 million units, 94·3% of that generated. This gives the total for 1950 so far as 32,704 million units, an increase of 10·5% on the corresponding period of 1949.



POWER SUPPLY IN AUGUST

THREE B.E.A. stations increased their generating capacity by the commissioning of plant during August, Leicester (Freeman's Meadow) leading off with a 31·5 MW Richardsons-Westgarth turbo-alternator and a 175 k lb/hr International Combustion boiler. The station installed capacity is thus brought up to just over 152 MW. In the London Division, the continuation of extension work at West Ham was marked by the commissioning of the third 180 k lb/hr boiler in the "B" station. Finally comes Staythorpe (East Midlands Division) with a 240 k lb/hr Babcock and Wilcox boiler that brings the station's evaporative capacity up to 960 k lb/hr for the 120 MW of turbo-alternator plant at present commissioned.

During the month the generating capacity of the North of Scotland systems increased by 33 MW, bringing the total increase there to 88 MW so far this year, after remaining near 325 MW for the whole of 1949.

Generating Plant

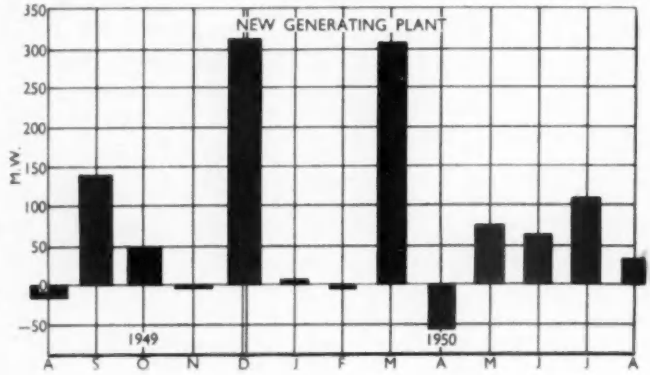
At the end of August, 1950, the installed generating capacity of the B.E.A. was 14,064 MW, 31 MW more than at the end of July. The North of Scotland total was 413 MW, showing an increase of 33 MW during August, and this figure for overall increase during the last twelve months becomes 949 MW, or 7·8%.

The installed capacity, used for the purpose of this graph, should be distinguished from the output capacity. The installed capacity is the total m.c.r. of all the generating sets which are connected on both steam and electric sides and are suitable for use.

Generation

Of the total energy generated, 3,646 million units came from B.E.A. stations and 96m from the North of Scotland, a ratio of 38 : 1 for installed capacity ratios of 34 : 1. For both the B.E.A. and the North of Scotland authorities the effect of the wet summer is noticeable in the greater water power production—nearly four times as much as in August, 1949, for the B.E.A., and one and a half times for the North of Scotland.

Figures now available show that the simultaneous maximum load during July was 8,268 MW, the lowest monthly figure recorded this year, but still over 9% higher than the corresponding 1949 total.



The BUYER'S *Column*

Simplex enter Fluo' Fittings Field

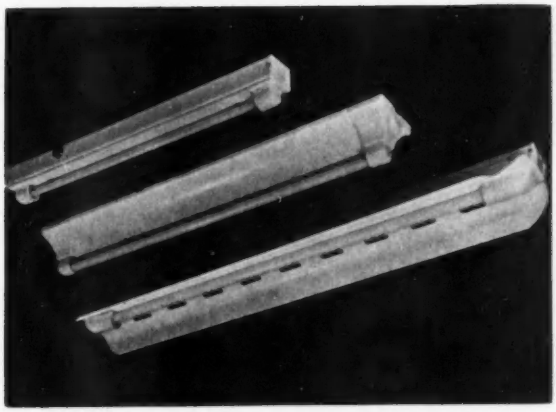
IF one studies the design of the fittings with which SIMPLEX ELECTRIC LTD., Broadwell, Oldbury, Birmingham, have entered into the fluorescent field, the impression gained is that here is a welcome competitor. For these fittings are characterised by the careful design and attractive style which has for years been one of the properties of Simplex tungsten lighting fittings.

The present range of fittings includes Simplex "Seagull" in three sizes, 3 ft 30 W, 4 ft 40 W, and 5 ft 80 W; Channel fittings in 3 ft 30, 4 ft 40 W, 5 ft 80 W sizes and Industrial Reflectors in two sizes, 4 ft 40 W and 5 ft 80 W.

The smooth lines of the Simplex fluorescent fittings are effected by pressing and rolling in the construction of the fitting. They fit flush with the ceiling with no visible fixings. The lampholder covers are hinged and the lampholders are spring-loaded for easy lamp replacement.

The fittings are complete with thermal starter switch but instant start units can be supplied with 80 W size if required. Earth terminals are provided. On the 30 W and 40 W channel fittings bi-pin lampholders are attached by an ingenious single-screw fixing which ensures the lampholders being correctly spaced.

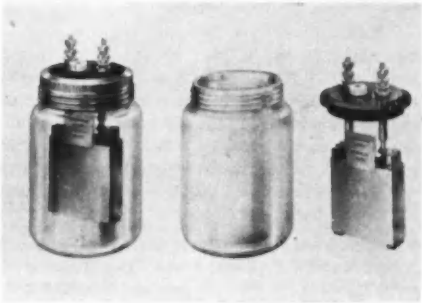
All fittings are finished in high gloss white stove enamel. The channel fitting is equipped with embossed end pieces which interlock for continuous troughing. The industrial reflectors are basically the same as the channel fitting, the difference being the addition of a quickly attached reflector affording a full 20° cut-off.



The three fluorescent fittings which mark Simplex Electric's entry into the fluorescent fitting field

New Cell for Rail Signalling

AUGMENTING the existing range of all-steel alkaline accumulators used in railway signalling is a new cell in a glass container, the first of its kind, manufactured by NIFE BATTERIES LTD., of Redditch, Worcs.



The new alkaline glass cell

Whilst retaining the same electrical characteristics as the company's all-steel series of cells, the new type with its increased container size allows a greater bulk of electrolyte which, in certain applications, offers many advantages, one of which is the simplification of and reduction in maintenance which is necessary with these cells.

In installations where a battery of these new cells "floats" across a rectifier with a nett current input slightly higher than the continuous load imposed by signalling or associated equipment, the battery would require attention probably once a year. The frequency of complete electrolyte renewals should not be necessary more than once in every four or five years.

The new Nife glass cells are available in capacities from 10 to 55 Ah at a nominal voltage of 1·25 per cell.

The plate group suspended by terminal bolts fitted with standard railway terminals is encased in an outer steel sleeve which can be lifted out by unscrewing the metal ring holding the container in position. This glass container provides insulation from earth of a very high order—an important factor in track circuit operation.

D

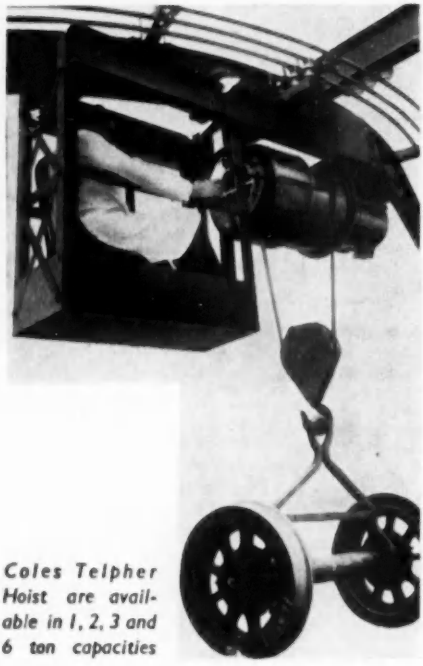
Easy Going over Rough Country

RAPID precision handling of materials over obstructed terrain is one of the properties claimed with complete justification by STEELS ENGINEERING PRODUCTS LTD., Crown Works, Sunderland for their latest introduction, the Coles Telpher Hoist.

It comprises a Coles electric hoist mounted between an electric travelling trolley and a driver's cab. This driver's cab is suspended in a position which gives the operator an uninterrupted view of the load and working area. Hoisting and travelling are controlled from a push-button control box in the driving cab.

Manufactured in 1, 2, 3 and 6 ton models for a.c. and d.c., the Telpher Hoists travel up to a speed of 300 ft per minute and can negotiate a minimum radius of 10 ft in the runway. In the case of models for a.c. operation, a creeping speed attachment can be fitted to give approximately 10% of normal lifting and lowering speeds, an arrangement ideal for the exact positioning of heavy parts for machine assembly and in foundries.

Self resetting limit switches adjustable to cut out in any desired position prevent overloading and over lowering. Electromagnetic brakes are fitted which hold the load immediately the current fails.



Coles Telpher Hoist are available in 1, 2, 3 and 6 ton capacities

G.E.C. introduce 1 kW, m.v. Lamp

THE largest mercury vapour lamp available up to now in the "Osram" range has been the 400 W size. This necessitated the installation of many such lamps in large spacious buildings in order to provide the necessary level of illumination.

The new 'Osram' 1 kW, m.v. lamp has an isothermal glass bulb

However, the GENERAL ELECTRIC CO., LTD., Magnet House, Kingsway, W.C.2, has now developed an "Osram" 1 kW mercury lamp, allowing a consequent reduction in installation and maintenance costs. The new lamp has an average efficiency through life of 45 lumens per watt, some 25% higher than figures for the 400 W lamp. Its average light output is nearly twice that of a standard 1,500 W gasfilled tungsten lamp. The glass bulb of the lamp is isothermal and is fitted with a g.e.s. cap. Having an arc voltage of 300 V the lamp requires a 400 V mains supply.

Also introduced is a high bay reflector fitting for this lamp. It comprises an anodised aluminium reflector mounted below a vitreous enamelled canopy with large ventilation slots which carries an auxiliary "Saaflux" type aluminium cone reflector.

TRADE PUBLICATIONS

IMMERSION HEATERS. Immersion heating units for domestic and industrial purposes are covered by a new coloured folder, List No. 50, with separate price list (R. 262), issued by Aidas Electric Ltd., of Sadia Works, Rowdell Road, Northolt, Middlesex. In addition to single-element heaters, side entry heating groups and circulators, top entry circulators and circulating pipes, and "Spirod" units for side or top entry are included.

INDICATOR LIGHTS. Under the above title, a new leaflet is to hand from William McGeoch and Co., Ltd., of 28 West Campbell Street, Glasgow, C.2, listing standard and special patterns of indicating and signal lamps for panel or box mounting using either pigmy or standard size lamps or for independent mounting of the lamps.

TRANSFORMERS. SEM/5/250 is the number of a leaflet issued by Small Electric Motors Ltd., Beckenham, Kent, which describes the transformers and chokes made by the company.

THE WEEK

INDUSTRY *in news* COMMERCE

Dutch-Danish Cable Laid

COINCIDENTAL with the celebration of the centenary of the first submarine cable across the Straits of Dover, comes news of the successful completion of the laying of submarine telephone cables between Holland and Denmark. Two new high-speed cables have been laid between Oostmahorn and Romo, a distance of about 250 miles, two submerged repeaters being inserted in each. The cables were made by Submarine Cables Ltd. for the Netherlands and Danish Administrations.

The construction consists of a specially designed composite conductor insulated with Telcothene. Over the core is a copper screen of six spirally applied tapes lapped with a short lay copper tape, forming the "return" conductor. Tarred jute yarn forms a bedding for the armouring wire and two final servings of tarred ply jute yarn gives a gauge of about 2 inches. Landward ends of the cables are protected by a further insulation of Telecothene.

Power to operate the repeaters is obtained from terminal apparatus at the shore ends and fed over the central conductor. Apart from the shore ends which were laid by small craft belonging to the Administrations, the cable, weighing over 3,000 tons, was laid by H.M.T.S. *Monarch*.

International Packaging

ADVANCE information has been released this week on the second National Packaging Exhibition to be held next year at Olympia from January 30 to February 9. We note that already there is a 40% increase in the number of exhibitors over its predecessor in 1949 when the venue was Manchester. Of particular interest is the international character of the coming exhibition at which visitors will be able to compare our own methods and achievements with those of other nations.

Although packaging is more usually attributed to smaller merchandise, especially in the grocery and cosmetic trades, it is of equal importance to manufacturers of large goods and of machinery. In this connection, a feature of the 1951 exhibition will be the large amount of space devoted to exhibitors of machinery and equipment. Total to date is approximately one-third of the space let.

R.P.S. 95th Annual Exhibition

HIGHLIGHT at the Royal Photographic Society's 95th Annual exhibition, is to our mind the interesting radiograph of an "Avometer." Second was a steel plate taken with 2 million volt x-rays. The use of radiography in industry and engineering research is already so widely known that there is no reason to enlarge on the subject. We would, however, point to these plates as two first-class examples. Much other very interesting material is displayed, some of the work in the colour transparencies section being particularly worthy of note. The exhibition, at the Society's centre, No. 16 Princes Gate, Kensington, London S.W.7, is open until October 15, weekdays 10 a.m.-8 p.m. and on Saturdays and Sundays. It will then transfer to the Laing Art Gallery at Newcastle-upon-Tyne.

Radio and T.V. Sales Up

ANTICIPATION of the winter months and thought of home entertainment are suggested as reasons for the slight improvement of radio and television sales during July. The R.T.R.A. report, however, that the average sum involved per sale is less, and in the case of television the average amount paid by a customer is £64 15s. The index shows that sales of both radios and television sets are still lower than in the corresponding month last year. The R.T.R.A. index gives the average number of receivers sold per shop.

Month	1950	1949
Radio		
June	8.11	9.39
July	9.07	9.48
Television		
June	3.88	4.35
July	4.51	4.63

Mechanical Indexing

PAPERS published in the "Proceedings" of the Institution of Mechanical Engineers during the years 1847 to 1949 are listed in a subject-index prepared by Mr. A. R. Stock, F.L.A., for the Institution. In this most useful booklet the titles of the papers are given chronologically under broad subject headings alphabetically arranged, and a brief author key is also included.

The First Half-Century

The Cable Makers' Association has issued a circular suggesting a basis for specification as a step towards that standardisation which the majority of electrical engineers consider is the great need of the industry. We fear, however, that it will be a long time before anything like uniformity is obtained. What is really wanted is the standardisation of the consulting engineers.—*From our issue of September* 20, 1900.

Electrical Machine Control

THIS week a Vacation School on the Control of Electrical Machines is being held at the Imperial College of Science and Technology, Exhibition Road, London. The school, which lasts from Monday, September 18 to Friday, September 22, covers the general problems arising and gives details of modern techniques.

Opening the school, Mr. W. M. Couch, C.B.E., M.I.E.E., Deputy Director of Electrical Engineering to the Admiralty, pointed out that new knowledge in the electrical world was accumulating so rapidly that it was only possible for an individual to keep abreast of developments in one particular field. He further referred to the necessity for co-operation between the universities, industry and the Government, and suggested that it would be good for periodic changes of staff to be made between these three organisations.

On control gear, development had, in the past, tended to lag behind machine design, but now was making rapid strides. Many new techniques were coming into operation, involving a closer co-operation between the methods hitherto peculiar to the light and heavy industries. Mutual benefit could be derived by welding together these techniques. One class of mechanisms—servo-mechanisms, was of great importance to the Admiralty who were now also concerned with problems of high-speed regulation of alternators, and accurate speed control of large and small motors. He hoped that the school would be able to advance the solutions to these problems.

Rectangular Lighting

ELECTRICITY showrooms are setting a good example in store lighting. Latest to have newly designed fittings installed is the Eastern Electricity Board at their Brentwood (Essex) showrooms. The installation of 4 ft 40 W fluorescent lamps, by G.E.C., is in three parts.

Two of the features consist of eight fittings each, so placed to form rectangles with two fittings to each side of the rectangle. A third feature in the centre of the showroom consists of ten fittings also forming a rectangle. Bronze coloured couplings have been used at the joints and the outline is maintained at the corners by sheet steel corner boxes. The "Perspex" enclosures can be taken out individually and the undersides of the corner boxes are removable to get to the wiring.

The centre feature of Eastern Electricity Board's new lighting installation at their Brentwood showrooms

Electrons in Paris

ELECTRON MICROSCOPES, manufactured by Metropolitan Vickers Electrical Co., Ltd., have attracted considerable attention at the International Congress and Exhibition of Electron Microscopy, which is being held in Paris this week. Two instruments were flown over for the occasion, one a research model and the other a general purpose instrument for routine purposes, and various items of auxiliary equipment accompanied them. Metropolitan-Vickers are also prominent in the Conference, three members of the research staff, Messrs. A. W. Agar, F. H. Davis, and R. M. Revell are presenting a paper on "The Metallographic Study of Low Alloy Steel by the Optical and Electron Microscopes."

Midland H.Q. for B.B.C.

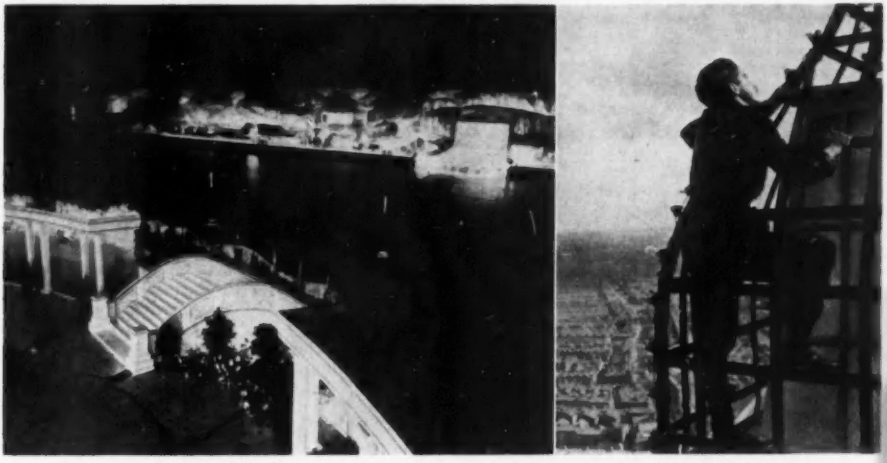
PLANS are almost complete for the building of a new headquarters for the B.B.C. on a site in Pebble Mill Road, Birmingham. The erection of the building will depend on the "national situation," and Mr. H. J. Dunkerley, regional controller, told a Press conference that there seemed no early prospect of the work being started.

Explosives in Coal Mines

THE explosion in Whitehaven William Colliery in 1947, led to a complete review of the whole field of safety in relation to the use of explosives in coal mines. To achieve this end a Committee was set up, with the Chief Inspector of Mines as chairman, and a report "Safety in the Use of Explosives in Coal Mines" has now been issued by the Ministry of Fuel and Power (H.M.S.O., price 1s. 6d.).

The Committee is of the opinion that as the present Order stands, it defeats its own ends by endeavouring to regulate for every possible contingency and is therefore so complicated and so involved that few of the people directly affected by it ever thoroughly read it and digest it.

Considerable revision is recommended in all directions. On the electrical side it is suggested that all exploders should be of an approved type and that electric detonators should have coils of standard length and be carried in cases with internal



The newest feature of the Blackpool illuminations, switched on last weekend, is a tableau in the open air baths; and, right, an electrician checks the wiring for bulbs on the Tower

compartments each made to contain a single detonator. The inside of the case should be entirely insulated.

It is further recommended that all shot-firing cables should be made to an approved specification.

Power Cuts in Yorkshire

HOUSEHOLDERS in the Yorkshire Electricity Board Area will receive a card within the next few weeks warning them of the days on which they can expect power cuts. The cuts will come during the peak hours and domestic consumers and business premises will be put on a rota to receive such cuts as are necessary. The Yorkshire Electricity Consultative Council is planning a fairer distribution of electricity load-shedding during the winter.

The cards can be hung in kitchens and offices and will give details of the rota system by which different areas will have supplies cut on different days of the week.

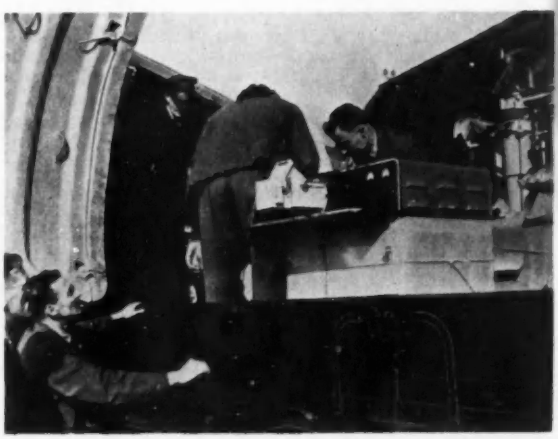
Welding Techniques

RADIOGRAPHIC examination of welds is among the subjects dealt with in recent publications of the British Welding Research Association, 29 Park Crescent, London W.1. The document concerned is entitled, "Recommendations for the Standardisation of the Radiographic Examination of Welded Joints in Mild Steel Pressure Vessels," and has been prepared by a specialist committee of the Association. Another committee has produced a series of "Recommendations for the Design and Fabrication of Arc Welded Structural Steelwork, Built-up Girders, and Compression Members" which is also published in booklet form. Both publications are obtainable, price 1s. 6d., from the address given above.

Paging Parents

SOUND systems which have been installed at Barry, Glamorgan, will ease the task of the Beach Inspector in tracing the parents of lost children. They will also assist at swimming galas and help to give boaters instructions at the boating lake. The installation was by G.E.C., and consists of 60 W amplifiers feeding 46-in. exponential horn loudspeakers and 4-unit power horns.

Two Metropolitan-Vickers electron microscopes being transferred from lorry to freight plane at Ringway Airport for transport to the exhibition of the International Congress of Electron Microscopy at Paris



Berry's Electric Ltd.'s stand at Chicago Trade Fair this month. Background and material were prefabricated in this country

Electricity and Rearmament

In the course of his review of the economic effect of the Government's new policy of rearmament in the House of Commons last week, Mr. H. Gaitskell, Minister of State for Economic Affairs, said the Government thought that electricity shortages should not interfere with the rise of output programme, but there was this qualification, it was obviously more than ever necessary that domestic consumers should not compete with industrial needs by piling on their own demands at peak hours. Later, he stressed that it would be the height of folly to plan for a big increase in military equipment while ignoring as a war potential an adequate level of generating capacity.

Productivity in Iron Foundries

A STRONG recommendation for the installation of machinery and other mechanical aids is made in the report of the productivity team on grey iron-founding, which visited the U.S.A. earlier this year. Although it is stressed that in Britain many of the foundries are confined to jobbing work, it is suggested that careful consideration should be given to the installation of such equipment as cranes, overhead runways, hoists, electro-magnets, moulding machines, and floor transport of the fork lift type. It is pointed out that in America, wherever the stockyard was covered by a crane, electro-magnets were used to handle all the pig and scrap iron. Another point—in some jobbing foundries in Britain the skilled moulder often spends not more than half his time in the actual production of moulds, the rest of his time being occupied in general labouring and kindred duties. In U.S. foundries, it was found that such work was done expeditiously and economically by lower rated labour using mechanical appliances. The report deals at some length with a number of American practices in the industry.

New Collier for B.E.A.

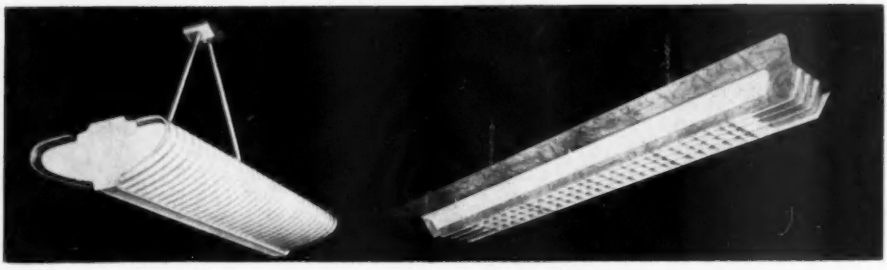
LATEST addition to the B.E.A. fleet, the 4,600 ton collier *Sir Archibald Page*, was launched at Sunderland last week. Sir John Hacking, speaking after the ceremony, said that the B.E.A. fleet consisted of 37 vessels in operation, making up a total tonnage of 88,000. They ranged in size from 1,600 to 4,600 tons and 24 of them are being used for coaling power stations on the Thames.

B.I.C.C. Servicing

A MOBILE servicing unit has been established by British Insulated Callender's Cables Ltd. for the B.I.C.C. resistance welding machines. This they hope will encourage a closer relationship between the user and manufacturer.

A specially trained engineer will be in charge of the unit which will consist of a 10-cwt van fitted to carry tools, spare parts and welding accessories. The engineer will service B.I.C.C. machines, advise customers on welding problems and sell electrodes and other accessories. There will be no charge for servicing and although only one van is being employed at present, others will follow after the initial trial period.

Among the "Sieray" fluorescent fittings displayed in showrooms of Siemens Electric Lamps and Supplies Ltd. all over the country this week are these two fine looking examples. They are (left) the Model FTF2252 in opal perspex lined brown in satin bronze aluminium frame, and (right) the FTF5442 which is a fitting designed with aluminium wings veneered with sycamore. The louvre is stove enamelled white



News in Brief

Electrical equipment will be coupled with textile machinery at the Lyons International Fair, from March 31 to April 9 next year. The section will occupy about 130,000 sq ft.

The Midlands Ideal Home Exhibition will be opened at Bingley Hall, Birmingham by the deputy mayor of Birmingham on September 27. It will remain open daily from 2 p.m. to 10 p.m. until October 21.

Brush Coachworks Ltd. are showing three of their battery electric vehicles at the 64th annual Dairy Show on October 24. They include two models designed for milk delivery and a third designed as a mobile kiosk.

G.E.C. has reorganised the distribution of their dry batteries and established a Battery Central Stores at Witton Works. It is hoped that production will be synchronised more closely with demand and that the time between manufacture and supply to dealers will be reduced.

Total attendance at National Radio Exhibition at Birmingham was 128,260. The aggregate attendance was lower than Radiolympia but the target of 100,000 was easily exceeded and paid attendances every bit as good as in London.

Cases in Court

Valuation Appeal

The North of Scotland Hydro-Electric Board were unsuccessful appellants at Inverness and Aird Valuation Appeal Committee in Inverness last Friday, and a stated case was asked for on behalf of the Board. The appeal was against the Board's being entered in the Valuation Roll as proprietors and occupiers of 22 prefabricated timber bungalows built on the Glen Affric hydro-electric scheme at Cannich.

For the Board, it was stated that the houses had been erected by John Cochrane and Son, Ltd., the contractors, on ground belonging to the Board, to accommodate their workmen during the progress of the scheme. The Board had taken no part in the erection of the houses or their running, had no say in who was to be tenant or occupier, and therefore objected to being put out of pocket to pay owners' and occupiers' rates.

The county assessor said the land on which the houses stood belonged to the Board, and Messrs. Cochrane could not be entered in the roll as they had no lease with the Board.

The assessor's view was upheld by the Committee.

Fatal Shock from Lampholder

Following a fatal accident at Cliff Quay power station last March, Ipswich magistrates on Friday dismissed a summons against the British Electricity Authority alleging that they had failed to protect an electric light fitting at the station. Messrs. William Kenyon and Sons, sub-contractors for certain work at the station, who had been brought to court by the B.E.A. as the party responsible, were convicted of the offence and fined £50, with £19 costs. Mr. R. H. Thompson, district inspector of factories, said the deceased, who was engaged in slagging operations at a boiler, received a fatal shock when he touched the metal holder of an uncaged fitting temporarily installed by William Kenyon and Sons. The lampholder had no protecting skirt or guard, it was alleged, but since the accident the holder could not be found.

Alleged Theft

On a charge of stealing £1,999 10s. 11d. when employed as a cashier by the Merseyside and North Wales Electricity Board, Idris Owen was at Colwyn Bay last week sent for trial to Denbighshire Quarter Sessions. He was allowed bail and granted legal aid. The period covered by the charge was from March, 1949, to August 31 last, and the money was alleged to represent collections from electricity slot meters.

It was stated that slot meter collections were checked daily by the senior meter collector, entered in the cash account book, and then taken to the Board's office in Station Road, Colwyn Bay. From February 9, 1949, to August 21, 1950, meter collections totalling £7,007 were handed to accused, who signed the cash account acknowledging receipt. The keys of the safe were held exclusively by him up to June 2, 1950, and he should have banked the money from day to day.

From time to time Owen paid into the bank monies which he accounted for, but which, it was alleged, were short of what they ought to be. The prosecution alleged that Owen abstracted what was termed a "balanced deficiency" for his own use, and that balanced deficiency lay in the bottom drawer of the safe for some considerable time until accused felt it safe to use it.

Mr. G. H. Parry, cashier employed by the Electricity Board, said he visited the Colwyn Bay office on August 29 last to check the money, and the documents produced showed that the cash was not correct. No explanation was forthcoming. In cross-examination, he agreed that it was his duty to check the cash records of offices in N. Wales periodically, but that he had not visited the Colwyn Bay office since vesting day.

Mr. D. G. Thompson, internal audit clerk, said that no check of prepayment cash records had been made at the Colwyn Bay office from the take-over date. Books and records were maintained and audited at Wrexham from information supplied by the Colwyn Bay office. Owen sent receipts supporting the money paid into the bank, but not supporting the whole of the money received. That was why the alleged discrepancies could not be discovered.

Electric Supply News

Blaydon

Plans for the erection of a generating station on the old Blaydon racecourse are being supported by the Urban District Council.

Belfast

When the Corporation Electricity Committee considered a report from its consulting engineers on the provision of buildings for increased stores, workshops and offices accommodation at the Harbour power station, a member said that it would appear that the architectural work had been given to a Glasgow firm. He thought that, where possible, preference should be given to local architects and contractors in work on the proposed buildings. The Committee approved in principle of the carrying out of the extensions, which will cost £126,000. It was decided to inform the consulting engineers that as much work as possible should be given to local contractors.

Eire

The rural electrification scheme of the Electricity Supply Board which began in November, 1946, has to date involved some 5,300 miles of wiring, together with about 105,000 poles. It is estimated that there are nearly 800 areas, of an average size of 25 sq miles, which have yet to be developed. The Government has asked the board to have the scheme completed within ten years.

Eton

The U.D.C. has now withdrawn its protest against the Southern Electricity Board's proposal for an overhead cable in the Eton Wick and Summerville Road areas, subject to the matter being reviewed by the Ministry of Fuel and Power in five years' time.

Meaford

Among the terms on which planning consent was issued to the B.E.A. for the extension to the Meaford power station (referred to at the inquiry, reported in our September 7 issue), is one stipulating that the Authority will, as soon as possible, plant and maintain belts of trees on the site, in accordance with a scheme being prepared. Other terms of consent deal with grit and smoke elimination, noise and vibration suppression, etc.

Power Station Extensions

The B.E.A. has received the formal consent of the Ministry of Fuel and Power to the development of the new Staythorpe power station to its full capacity, and to an extension of the Huddersfield station. In regard to Staythorpe, the authorisation covers the installation of a 60 MW turbo-alternator and four 240 k lb/hr boilers. When fully completed this station will have a total installed capacity of 360 MW. The Huddersfield consent covers the installation of a 30 MW set and two 180 k lb/hr boilers in addition to the construction of a cooling tower.

Southern Board

For the 1950-51 financial year the capital expenditure of the Southern Electricity Board is to be £644,000 less than the Board had estimated, it was disclosed at a meeting of the Consultative Council last week. The Board's revised estimate of anticipated expenditure for the year was £5,156,000, but the Central Authority had now stated that only £4,512,000 could be allocated. The board therefore proposes to restrict as far as possible expenditure on non-operational land and buildings, transport and standardisation of system. In addition, reinforcement of the system will be limited to the most urgent schemes, and a small risk of distribution plant shortage will be taken by postponing the less urgent reinforcement schemes so that there shall be the largest possible sum remaining available for developing new supplies. In allocating funds available for new development, priority will be given to industrial consumers, and certain categories of non-industrial consumers. The broad effect of these steps will be to allocate the final available funds as follows: New development, £2,199,000; reinforcement of system, £1,963,000; non-operational land, buildings, transport, and standardisation of system, £350,000. The Board anticipate that the amount remaining available for new development is such that they will not find it necessary to refuse any of the priority categories of new supplies.

LIGHTING SCHEMES

Castle Donington. The Parish Council is to proceed with its plan for electric street lighting.

Coventry. The new lighting system for three miles along the London Road was officially inaugurated recently. The scheme, which cost £5,321, uses 250 W h.p. mercury vapour horizontal discharge lamps.

Horbury.—A £2,110 scheme for converting to electricity the gas lighting in the main Huddersfield-Wakefield Road through the town, has been submitted to the Ministry of Health.

Newtownards.—Erection of the columns in connection with the borough's £22,000 lighting scheme, is due to begin next week.

Sedgley.—The U.D.C.'s new lighting along three miles of the Wolverhampton-Dudley road was switched on last week. Revo Electric Ltd. installed the 123 230 W mercury vapour discharge lamps. The Council plans to light the classified roads linking Sedgley with Himley.

Spalding.—With part of the town now in darkness, the U.D.C. is still awaiting news from the M.O.T. regarding applications for consent to convert street lighting from gas to electricity.

Thame.—The U.D.C. General Purposes Committee has agreed that the Eastern Electricity Board should be asked for improved lighting in Upper High Street.

Whetstone (Leicester).—The new lighting system involving 51 electric lamps, was officially inaugurated recently.

Company Activities

Broom & Wade

The directors proposed a 100% capital bonus, "to bring the amount of the issue capital rather more into line with the amount of the capital invested in the business." The issue will capitalise £250,000 from the share premium account, which at September 30, 1949, stood at £368,912.

British Aluminium Co.

The directors are to consider on October 10 the payment of an Ordinary interim dividend for 1950. Such interim dividend—if any—will be payable on November 1 along with the Preference dividend for the six months to June 30 last. This is stated to be in accordance with the decision announced in the directors' report this year that the Preference dividend would be payable at a later date than formerly customary, which is in line with the later presentation of accounts and payment of the final Ordinary dividend. For 1949 an interim dividend of 4%, payable October 1, was followed by a final of 6% payable May 3 last.

Newton Bros. (Derby) Ltd.

Trading profit for the year to March 31 was £115,006 (*£84,421*), less reserve for stock contingencies £5,000 (*nil*), plus other income £1,988 (*£1,438*), rents £148 (*same*), and bank interest £356 (*£305*), making £112,500 (*£86,312*). To depreciation £9,373 (*£7,247*), directors' emoluments: as directors £1,625 (*£1,500*), as executives, including pension contributions, £8,697 (*£8,169*), profits tax £14,750 (*£12,500*), income tax £39,303 (*£28,003*), leaving net profit of £38,749 (*£28,893*). With £14,808 (*£15,092*) brought in there is £53,558, and net adjustment re patent royalties nil (*£16,685*), making £53,558 (*£60,670*) available. To general reserve £4,117 (*£35,000*), replacement of fixed assets and equipment £11,000 (*nil*), staff pension fund £5,000 (*nil*), workpeople's retirement and benevolent fund £4,000 (*nil*), dividends 10% plus 5% bonus £13,033 (*£10,862*), leaving a balance of £16,407 carried forward.

Power Corpn. of Canada

For the year to June 30 last, gross earnings were $1,971,062 ($*1,926,364*), and net earnings $1,592,098. Net profit of $1,397,848, equivalent to $1·74 a share on common ($*1,323,821 or $1·57 a share*). Two dividends totalling $1 per share were paid on Common, leaving $334,073 to add to the surplus. The net profit of $308,238 realised on sale of investments has been added to special reserve.

Vactric Ltd.

Consolidated trading profit for the year to March 31 was £145,588 (*loss £59,507*). Allowing for audit fee £1,844 (*add £1,613*), interest on Treasury loan £13,600 (*£7,648*), depreciation £33,557 (*£29,837*), reduction in stock values for redundancy and obsolescence £16,247 (*nil*), there is balance of £80,340 (*loss £98,605 less unrequired tax reserves £10,580*). To taxation £9,106 (*£2,631*), leaving net profit £71,234 (*loss £90,868*), reducing the loss carried forward to £29,177 (*£100,411*). Parent company's trading profit was £144,161 (*loss £17,440*). Deduct audit fee £720 (*add £756*), directors' emoluments £11,350 (*£4,290*), interest on Treasury loan £13,600 (*£7,648*), depreciation £32,754 (*£29,100*), making net profit of £85,737 (*loss £59,234*). Deduct additional provision required for Vactric Inc. deficiency £6,670, reduction in stock values for redundancy and obsolescence £16,247, leaving £62,820 (*loss £110,583*), add subsidiary dividend £443 (*deduct same and unrequired tax £10,000*), reducing loss carried forward to £67,829 (*£131,092*).

The company is applying to the Treasury for the advance of a further portion of the Treasury loan as the directors consider that the balance of the loan can now be usefully employed in the business. The Treasury originally agreed to lend the company £500,000, but to date only £360,000 has been taken. Announcing this in his annual review, the chairman, Mr. J. Paterson, discloses that since March 31 considerable demand for the company's products has been experienced, and the company continues to operate at a profit. The directors are considering methods of increasing production and sale, and it is for this purpose and also for the purpose of affording additional credit to buyers both at home and abroad that the board are asking for the further advance on the loan.

During the year to March 31, the company disposed of its entire output, 40% being sold overseas. Every effort, it is stated, is being made to extend the export trade, and substantial inquiries are being received.

Dividends Declared

Associated Electrical Industries Ltd. Interim Ordinary dividend of 5% (*same*), payable on Oct. 17.

Bagdad Light and Power Co. Dividend of 7%, tax free (*same*).

Calcutta Tramways. Final dividend of 3½%, tax free, making 6% (*both same*).

Crofts Engineers (*Holdings*). Interim dividend of 15% (*same*).

Delhi Electric Supply and Traction Co. It is proposed to distribute 30s. per £1 stock unit. (The undertaking has been acquired by the Delhi Provincial Govt.)

Drayton Regulator Co. (*Holdings*). Interim dividend of 10%. Group net profit for 1949 was £52,416, and £6,600 net was paid in dividends to the holding company which acquired the issued capital of Drayton Regulator and Instrument Co., Ltd.

London Electrical and General Trust. Final Ordinary dividend of 5%, making 7% (6%).

S. Guiterman and Co. The Preference dividend due on Sept. 30 has been postponed until accounts for 1950 are available.

Commercial Information

CONTRACTS OPEN

HOME

Sept. 22.—Kidderminster T.C. Installation of electric lighting and heating points in 332 houses on various estates. J. G. Stewart, Borough Engineer and Surveyor, 110 Mill St., Kidderminster. Deposit £2 2s. (See August 31 issue.)

Sept. 22.—Westmeath C.C. Electrical installation to 40 cottages in Ballynacargy area. E. Woulfe, secretary, County Bldgs, Mullingar.

Sept. 23.—Holywood, N. Ireland. Electrical re-wiring of Croft House, Holywood. County Planning Office, Court House, Downpatrick.

Sept. 25.—Belfast. Industrial type radio receivers and speakers for N. Ireland Tuberculosis Authority. William Harvey, secretary, 27 Adelaide St.

Sept. 25.—Dunstable. Supply, erection and wiring of concrete street lighting columns, 15 ft and 25 ft in height. R. R. Hole, Borough Surveyor, Municipal Offices.

Sept. 25.—Littlehampton U.D.C. Electrical installations in 18 houses at Wickbourne. Engineer and Surveyor, Council Offices, Littlehampton. Deposit £1 1s.

Sept. 25.—Manchester. Pumping plant and contingent works at Northenden. City Surveyor's Office, Design and Construction Section, Town Hall. Deposit £2 2s.

Sept. 25.—Swansea T.C. Electrical installation at West Cross primary school. Borough Architect, The Guildhall, Swansea. Deposit £2. (See Sept. 7 issue.)

Sept. 26.—West Calder. Electrical work in police station and house. County Architect, 32 Palmerstone Pl., Edinburgh 12.

Sept. 28.—Belfast. Electrical fittings and equipment and installation of cable for staff-calling systems, for N. Ireland Hospitals Authority at Musgrave Park Hospital. J. R. W. Murland, Consulting Engineer, 13 Wellington Pl., Belfast. (Date altered from Sept. 14.)

Sept. 28.—Blackpool T.C. Electrical installation to 6 shops and 6 maisonettes on Grange Park estate. A. S. Hamilton, Borough Surveyor, Municipal Bldgs.

Sept. 28.—Hull T.C. Reconditioning of electrical and heating installations at Manor House, North Ferriby. City Architect's Dept., Guildhall. Deposit £1 1s.

Sept. 29.—Clare (Suffolk) R.D.C. Wiring of 10 houses at Kedington. Surveyor, Stonehall, Clare, Sudbury.

Sept. 29.—Dublin T.C. 100 "Swan Neck" lighting brackets and 200 modern type brackets with control gear boxes. City Engineer's Office, 28 Castle St.

Sept. 30.—Maidstone T.C. Wiring and replacement of electrical fittings in 26 houses. Borough Surveyor, Palace Ave., Maidstone.

Oct. 2.—Exeter T.C. Manufacture and erection of an electrically driven sludge pump of 10,000 gall. per hour capacity at Countess Wear Sewage Works. City Engineer and Surveyor, 7 Southernhay West, Exeter.

Oct. 4.—Hawick T.C. Electrical installation to 3 houses at Commercial Rd. Burgh Surveyor, Municipal Bldgs., Hawick.

Oct. 5.—Belfast T.C. Additions to electrical installation at Park Parade Intermediate School. Education Architect's Office, Academy St.

Oct. 7.—Stepney. Installation of electric lighting, heating and power at 145 flats and houses in Bancroft Rd. A. A. Hudson, Borough Engineer and Surveyor, Municipal Offices, Duval St., E.1. Deposit £5. (See Sept. 14 issue.)

Oct. 9.—Dunbar T.C. Electrical work on 16 houses at Summerfield. S. W. Brown, Town Clerk, Town House, Dunbar.

Oct. 9.—Fylde (Lancs). Erection of 2 small electrically driven pumps for Water Board. H. Will Apted, Engineer to the Board.

Oct. 10—Bristol T.C. Electrical work at the Crescent, Downend, and Downend Babies' Home. City Estates Surveyor and Valuer, The Exchange, Corn St., Bristol 1. Deposit £2 2s.

Oct. 10.—Tamworth T.C. Wiring in welded screwed tube of part of Tamworth Castle. H. F. Bruce Smith, Borough Engineer and Surveyor, Municipal Offices.

Oct. 10.—Galway. Electrical installations at Western Regional Sanatorium, Merlin Park. 4,650 medium voltage outlets for lighting, heating, cooking, etc., and 1,320 low voltage outlets for call systems, radio, clocks, etc. Secretary, Dept. of Health, Custom House, Dublin. Deposit £20.

Oct. 12.—Blackpool T.C. Installation of electric lighting, heating, power, bells, etc., at Grange Park county primary school. Borough Surveyor, Municipal Bldgs. Deposit £2.

Oct. 13.—Belfast. Water screening plant of vertical rotating band type to deal with 2,880,000 gal/hr, for Harbour power station. Merz and McLellan, consulting engineers, Carliol House, Newcastle-upon-Tyne 1. Deposit £5 5s. (See Sept. 14 issue.)

Oct. 18.—Metropolitan Water Board. Two sets of electrically driven well and surface pumps for Chingford Mill pumping station, Hall Lane, Chingford. Chief Engineer's Department (Room 235), Offices of the Board, New River Head, Rosebery Av., E.C.1. Deposit £1 1s.

Oct. 20.—Carlisle. Six vertical spindle motor-driven pumps and accessories, capacity 38 million gal per day. L. J. A. Stow, City Engineer and Surveyor, City Engineer's Office, Carlisle.

No date stated.—Aberdeen. Heating and electrical engineer works in reconstruction of classrooms and laboratories at Aberdeen Grammar school. J. A. O. Allan, Ross and Allan, Architects, 10 Bon-Accord Sq.

No date stated.—Fife C.C. Electrical work in 26 houses at Kinglassie. James Gentles and Son, Chartered Quantity Surveyors, Central Chambers, Kirkcaldy.

No date stated.—Fife C.C. Electrical and heating work at infants' school at Oakley. James Gentles and Son, Chartered Quantity Surveyors, Central Chambers, Kirkcaldy.

No date stated.—Haddington. Installation of electricity in 250 houses at present lit by gas. Burgh Surveyor, 55 High St.

OVERSEAS

*Details of items marked * may be obtained on application to Room 1076, Board of Trade, Thames House, North Millbank, S.W.1, quoting reference.*

Sept. 27.—Belgium. Parts and accessories for overhead electric cables for Belgian State Railways. B.o.T. (Ref. CRE (IB) 64081/50).*

Sept. 27.—Cape Town. 2,000 a.c. single-phase house service meters rated at 10 amp, 220 V, 50 c/s, 2-wire. City Electrical Engineer, Third Floor, Electricity House, Strand St., Cape Town.

Oct. 2.—Pakistan. 5,000 lbs bare copper wire, 3,000 yds 250 V single core cable, and 8 overground disconnecting boxes for Director-General of Supply and Development, Frere Rd., Karachi. B.o.T. (Ref.: CRE (IB) 64350/50).*

Oct. 3.—S. Rhodesia. Supply of 30,000 dry cells telephone 1·5 V, at rate of 7,500 per quarter, for Department of Posts and Telegraphs, Salisbury. Secretary, Tender Board, P.O. Box 123, Causeway, Salisbury.

Oct. 3.—Tangier. Total of 2,000 metres h.t. cables and 69 terminal and junction boxes, with insulating material. M. le Directeur de la Regie des Services de l'Eau et de l'Electricite, Tangier. B.o.T. (Ref. CRE (IB) 63502/50).*

Oct. 4.—Queensland. Supply, erection and maintenance of a radio communication system required by the Wide Bay Regional Electricity Board. Secretary, State Electricity Commission of Queensland, Scottish Union House, Eagle St., Brisbane. B.o.T. (Ref. CRE (IB) 63727/50).*

Oct. 6.—Uruguay. Two 3-phase induction motors of 120 h.p., 720 r.p.m., voltage 380/220, wound rotor, continuous operation with speed adjustment, for Gerencia Administrative de la U.T.E., Julio Herrera y Obes 1471, Montevideo. B.o.T. (Ref. CRE (IB) 62725/50).*

Oct. 10. — Wellington (N.Z.). 21,000 switchboard lamps, type B.Po. No. 2, carbon filament. Director-General (Stores Division), G.P.O., Wellington C.I.

Oct. 11.—Uruguay. 150 metres 3-phase rubber covered flexible cable for electric cranes, 220 V, for Administracion Nacional de Puertos. B.o.T. (Ref. CRE (IB) 63267/50).*

Oct. 11.—Wellington (N.Z.). 12 moving coil (d.c.) voltmeters for N.Z. Post Office (Stores Division).

Oct. 12.—Brisbane. 4,000 kVA 50 c/s transformer for City Electric Light Co. Ltd., for use between 33,000 V system and 11,000 V hydro-electric system at Somerset Dam on Stanley River.

Oct. 19.—Wellington (N.Z.). 3,000 ft of instrument cordage. N.Z. Post Office (Stores Division).

Oct. 25.—Cape Town. Supply of 3,800 230 V electric lamps for City Electricity Department. B.o.T. (Ref. CRE (IB) 63948/50).*

Oct. 25.—Queensland. 22 kV air break switches and earth leakage protection equipment for State Electricity Commission, Eagle St., Brisbane.

Oct. 26.—Brisbane. Metal-clad switchgear, 6 panels, 33 kV (3 feeder, 1 transformer, 1 bus tie and 1 bus section), 8 current transformer sets included in the panels, for City Electric Light Co. Ltd. B.o.T. (Ref. CRE (IB) 64304/50).*

Oct. 30.—Wellington (N.Z.). Supply of 1,000 kVA and 750 kVA distribution transformers for electricity dept. Electricity House, Cuba St., Wellington.

Oct. 31. — Bloemfontein T.C. One turbo-alternator, condenser and auxiliary apparatus. Merz and McLellan, 1,419 Escon House, Rissik St., Johannesburg. Deposit £2 2s.

Nov. 4.—Egypt. Supply and erection of turbo-alternator of 20-25,000 kW and 2 boiler units, at Cairo North Power Station for Cairo City Electricity and Gas Administration. B.o.T. (Ref. CRE (IB) 63682/50).*

Nov. 4.—Egyptian Govt. One 25,000 kW turbo-generator (or two units totalling the same power) and two boiler units complete with auxiliary switchgear and transformer, for Cairo North station. Chief inspecting engineer, Egyptian Government, 41 Tothill Street, London S.W.1. Fee £25 12s. 6d.

Nov. 7.—Wellington (N.Z.). One 50 MVA 220/110/11kV transformer bank and spare unit, comprising four auto-transformer units, each 16,667 kVA 127/63·5/11 kV, oil immersed and water cooled for Roxburgh power station. Contract No. 158, State Hydro-Electric Dept., Wellington. Deposit £100 B.o.T. (Ref. CRE (IB) 61858/50).*

Nov. 14.—Wellington (N.Z.). 110 kV outdoor switchgear and steelwork for Kinleith sub-

Your Queries — Answered

"EDU" hair dryer, makers of? E.B. — Siemens-Schuckert (Gt. Britain) Ltd., Great West Road, Brentford. (18732)

"Raprig" tower wagon extension, makers of? E.E.—Drew Clark and Co., Ltd., Lea Bridge Rd., Leytonstone, E.10. (18735)

"Air-Flow" electric fan, makers of? S.E.B.—Fenton Byrn and Co., Ltd., Swains Rd., S.W.17. (18739)

"Windak" electric blankets, makers of? A.H.—Baxter, Woodhouse and Taylor, Ltd., Queen's Bldgs., St. Peter's Sq., Stockport. (18743)

"Mitre" towel rails, makers of? M.I.E.—Albany Sheet Metal and Engineering Co. (Oldham) Ltd., Albany Mills, Vulcan St., Oldham. (18749)

"Deco" cable drums, makers of? W. W.—Dalyte Electrical Co., Ltd., 22 West Row, N. Kensington, London, W.10. (18754)

"De Frosta" immersion element for water cisterns, makers of? L.E.B.B.—De Frosta Mfg. Co., 16 Aultone Way, Sutton, Surrey. (18758)

J. P. Hall and Co., Ltd., crane and motor makers, address of? W.O.—This firm were at Blackriding Works, Werneth, Oldham, but we can no longer trace them. (18,765)

The above are selected from questions we have answered this week. If you have a query, send it to us.

station for State Hydro-Electric Department. Deposit £100.

Nov. 16. — Portuguese West Africa. Transmission line from Mabubas hydro-electrical power station to substation at Luanda. Directorate General of Colonial Development, 12 Praca do Principe Real, Lisbon. Provisional deposit of £4,375 with Bank of Angola, Lisbon, B.o.T. (Ref. CRE (IB) 62304/50).*

Nov. 28. — Wellington (N.Z.). 50 kV outdoor switchgear and structure for Gisborne substation for State Hydro-Electric Department. Deposit £100.

Nov. 29. — Queensland. Two water-driven turbo-alternators, each of 18,000 kW at 11,000 V, for Tully Falls hydro-electric scheme, for the Cairns Regional Electricity Board. Particulars from Agent General for Queensland, 409-410 Strand, London. Deposit £A3 3s. (Advertised in Sept. 14 issue.)

Nov. 30. — Egypt. Electrically driven air compressor charging bottles, 3 diesel pumps, cooling tower. Chief inspecting engineer, Egyptian Government, 41 Tothill Street, S.W.1. (Ref. 74/GPR 50/42).

Dec. 13.—Queensland. 14 transformers between 250 kVA and 20,000 kVA for Tully Falls Power Station, and Cairns, Innisfail, Golden Grove and Mt. Garnet substations. Secretary, State Electricity Commission, Scottish Union House, Eagle St., Brisbane.

Dec. 18.—Biopio (Angola). Building of a dam, power station and substation. Direccao Geral do Fomento Colonial, Principe Real, 13 Lisbon.

Dec. 21.—Brisbane. 30,000 kW turbo-alternator and accessories consisting of turbine, alternator, condenser, regenerative feed-heating equipment for Bulimba "B" power station. City Electric Light Co. Ltd., Boundary St., Brisbane. B.o.T. (Ref. CRE (IB) 63728/50).*

Jan. 17.—Uruguay. Fuel supply installations, turbo-alternators, equilibrating machine, pumps, valves and electric equipment for circulating water, filtering equipment, h.t. cells, control board, transformer substation, accumulators for thermo-electric power station. Usinas Electricas y Telefonos del Estado. B.o.T. (Ref. CRE (IB) 60735/50).*

PRICES OF CABLE METALS AND OTHER MATERIALS

(at Tuesday evening)

	£	s.	d.	New York price
COPPER, electrolytic	202	0	0	£196 0 0
Delivered in 2nd and 3rd month after order	215	10	0	—
Delivered in 4th, 5th and 6th month after order	217	0	0	—
LEAD, good soft pig (foreign)	128	0	0	128 0 0
" " " "English" quality	129	10	0	—
Delivered in 2nd and 3rd month after order, plus	7	0	0	—
TIN (99-99.75%) (Cash)	768-770			—
(3 months)	764-766			—
ALUMINIUM, commercial purity (del.)	112	0	0	—
ZINC	147	10	0	140 0 0
ARMOURING:				
Galv. Steel Wire (0.104 in.)	45	10	0	—
Mild Steel Tape (0.04 in.)	26	0	0	—

CONTRACTS PLACED

Barrow-in-Furness. Lighting, power and heating installations for Hawcoat junior and infants' school. N.W. Electricity Board, £3,388.

Brighouse T.C. Installation of electric wiring and fittings to 139 houses on Smith estate. Q. Electrics Ltd., £1,668.

Durham. Electrical installations at Hartlepool Hart Rd., county school and Henry Smith school. E. Dixon Barker and Son Ltd. £1,414.

Glasgow T.C. Supply of switchgear and starters for machinery at Castlemilk pumping station. Allen, West and Co. Ltd., £4,987.

Jarrow T.C. Electrical installation to 84 flats. McCabes Electric Services, Jarrow.

Newcastle-on-Tyne. Supply of 39 fluorescent street lighting fittings for Pilgrim St., B.T.H. Co. Ltd., £1,597. 68 sets of sodium equipment for Great North Rd., Metropolitan Vickers Electrical Co. Ltd., £930.

GAZETTE ANNOUNCEMENTS

COMPANIES ACTS

G. R. Scott (Electrical) Ltd. Resolution for voluntary winding-up passed at a meeting on Aug. 22. A. J. R. Coward, Chartered Accountant, Coward, Button and Co., 317 High Holborn, London W.C.1, appointed liquidator.

George Forrest and Son, Ltd. Meeting of creditors at Winchester House, Winchester St., E.C.2, on Sept. 29 at 11.30 a.m.

Caersws Electric Supply Co., Ltd. Meeting of members at 51-52 Broad St., Newtown, Montgomery, on Oct. 23 at 2 p.m., to receive account of manner of winding-up.

Cape Electric Tramways Ltd. Meeting of members at 4 London Wall Bldgs., Blomfield St., E.C.2, on Oct. 17 at 11 a.m. to receive liquidator's report.

Mold Radio Supplies Ltd. Resolution for voluntary winding-up passed at a meeting on Sept. 7. B. H. Hawkins, 14 North John St., Liverpool 2, appointed liquidator.

Dawes Radio and Electric Ltd. Meeting of members at 22 High East St., Dorchester, on Oct. 16 at 11 a.m. to receive liquidator's report, and to determine disposal of accounts and documents.

Kamba Electric Ltd. Meetings of members and creditors at A. E. Attwood and Co., 20-21 Lawrence La., Cheapside, E.C.2, on Oct 10. Members at 11 a.m. and creditors at 11.30 a.m.

Partnership Dissolved

Birmingham. John Owner, Peggy Owner, Frank Kirby and Ivy Mildred Kirby, trading as John Owner and Co., distributors of electrical apparatus, at 1213 Stratford Rd., Hall Green, Birmingham. Partnership dissolved as from July 21. All debts will be paid by John Owner and Peggy Owner, who will carry on the business.

BANKRUPTCY ACTS

First Meeting

The Generator and Stud Welding Co. Aries Works, Acton Lane, N.W.10. First meeting of creditors and contributories on Sept. 29 at Inveresk House, Strand, W.C.2, at 11.30 a.m. and 12 noon respectively.

Application for Discharge

Bournemouth. Aubrey Sydney Frank Carpenter, radio dealer, trading as Stourvale Radio Stores, Barrack Lane, Christchurch. Hearing at Law Courts, Bournemouth, on Oct. 20.

BUSINESS PROSPECTS

HOME

Ayr T.C. Permission has been granted to erect 100 houses at Forehill at an estimated cost of £129,300.

Barnsley. Erection of infant school in Summer Lane. Dyson, Cawthorne and Coles, 25 Regent St.

Battle (Sussex) R.D.C. Plans have been approved for construction of a holiday camp near Lydd Road, Camber.

Belfast. T.C. approved in principle conversion of dispensing premises at North Queen St., Springfield Rd., and Templemore Av., into nurses' homes at estimated cost of £11,000.

Birkenhead T.C. Erection of 8 houses at Clifford St., and 15 at Kingsley St. Borough Surveyor, 3 Conway St.

Blyth. T.C. is to modernise 700 houses during next 10 years. Work includes installation of electricity.

Camberwell. Erection of 186 multi-storey flats on Lordship Lane estate. Darrell Musker, Town Clerk, Town Hall, Peckham Rd., S.E.5.

Carmarthen R.D.C. Plans approved for expenditure of £6,400 for 33 houses on Llanddarog Camp site.

Carmarthenshire. Erection of infants' school at Llwynhendy for C.C. W. T. Lloyd, County Architect, County Hall, Carmarthen.

Coleraine, Londonderry. T.C. approved erection of 48 houses at Ballycairn Rd.

Doncaster. Erection of 7 shops and flats on Clay Lane estate. Estates Surveyor, 15 South Parade.

Dudley T.C. Erection of 165 houses on Sledmere estate. P. D. Wadsworth, Town Clerk, The Council House, Dudley.

Grangemouth T.C. Dean of Guild Court has approved the extensions to I.C.I. Chemical factory. Estimated cost is £34,000.

Greenock T.C. Approval has been received for substitution of electric lighting for gas in 212 houses at Belville St.

Harpenden (Herts) U.D.C. Erection of 19 houses on Batford estate. F. A. Harris, Clerk, Harpenden Hall.

Hornsea (Yorks) U.D.C. Approval has been received for erection of 74 houses on Burton estate.

Killybegs, Co. Donegal. Erection of cold storage buildings for Irish Sea Fisheries Assoc. Ltd. J. V. Tierney, Consulting Engineer, 15-16 Duke St., Dublin.

Kirkintilloch (Dumbarton) T.C. Dean of Guild Court has approved erection of 50 houses at Luggiebank.

Lampeter T.C. Erection of 26 houses on Bryn estate. T. Alwyn Lloyd and Gordon, Cardiff.

Lincoln. Erection of entry junior school, at Horncastle. County Architect, County Offices.

Llanrwst U.D.C. Construction of 20 houses at Tyddyn Fadog. Clerk of the Council, Plas-yndre, Llanrwst.

Macclesfield T.C. Erection of 40 houses on Ivy Rd. estate. Borough Architect, 3 Jordangate, Macclesfield.

Middlesbrough. Plans approved for children's home at Beechwood to cost £4,500. J. A. Kenyon, Borough Engineer, Municipal Buildings, Middlesbrough.

Newcastle. Erection of 51 houses, flats and bungalows on Benton Park Rd. site. City Architect, 18 Cloth Market, Newcastle-upon-Tyne 1. Also approval has been received for erection of fire station at west end of the city.

North Riding. Construction of grammar and commercial school at Redcar. J. Leathart, Architect, Mount Lodge, Sunningdale, Berks.

Paisley, Renfrew. Dean of Guild Court approved plans by C. T. Midgely and Co., Glasgow, to build factory at Scotts Rd., at cost of £5,000.

Porthcawl U.D.C. Erection of 104 houses at the Wilderness Housing Extension. A. C. Rees, Engineer and Surveyor, Council Offices, Porthcawl.

Rotherham T.C. Construction of 72 houses on Broom Valley estate. E. J. Manson, Borough Engineer, Municipal Buildings, Rotherham.

Runcorn (Cheshire) R.D.C. Erection of 48 houses at Ackers Lane, Stockton Heath. Wright and Hamlyn, Architects, 20 Winmarleigh St., Warrington.

Sunderland T.C. Erection of 12 shops and flats on Pennywell estate. Borough Architect, Grange House, Stockton Rd.

Uttoxeter (Staffs) R.D.C. Erection of 24 houses at Mayfield. Engineer and Surveyor to Council, Council Offices, Northgate, Uttoxeter.

Vaynor and Penderyn (Brecon) R.D.C. Construction of 30 houses at Pontsticill site. E. J. H. Hughes, Surveyor and Architect, Council Offices, Victoria St., Merthyr Tydfil.

Wembley T.C. Plans have been approved for erection of electricity substation.

West Ham T.C. Erection of 94 maisonettes and 8 flats in Arthingworth St., Stephens Rd., and Odessa Rd. T. E. North, Borough Architect and Planning Officer, 70 West Ham Lane, London, E.15.

West Riding. Erection of police station and court house at Gisburn. County Architect, Bishopgarth, Westfield Rd., Wakefield.

West Riding. Erection of police training school at Wakefield. County Architect, Bishopgarth, Westfield Rd., Wakefield.

Woking U.D.C. Erection of 52 houses at Maybury estate. H. P. Tame, Engineer and Surveyor, Council Offices, Woking.

Worcester. Construction of Nunnery Farm secondary modern school. Director of Education, 4 Copenhagen St., Worcester.

OVERSEAS

Melbourne. Opening likely for supply of radio beacons as further aids to navigation. Contact the Director of Navigation, Dept. of Shipping and Fuel, 497 Collins St., Melbourne.

U.S.A. William Arnos, purchasing agent for Motorola-Chicago Co. Inc., 4545 Augusta Boulevard, Chicago 50, wants supplies of radio and television hook-up wire (bare copper, tinned copper and enamelled copper wire), which are in short supply in U.S.

Also the National and Transcontinental Trading Corp., 11 Broadway, New York 4, want substantial supplies of carbon resistors.

TRADE NOTES

Changes of Address.—The Leeds office of W. T. Glover and Co., Ltd., is now at Britannia Hse., Wellington St., Leeds 1. Tel.: Leeds 31500.

The Mercury Discharge Lighting Co. Ltd. has moved to Premier House, 48 Dover St., Piccadilly, London W.1. Tel.: Regent 3001.

The Marine Department of Siemens Brothers and Co. Ltd. is moving on Saturday next, Sept. 23, from 81 Dale St. to 5 Rumford Place, Liverpool 3. Tel.: Central 5154.

On the same date, the phone number of the Liverpool branch of Siemens Electric Lamps and Supplies Ltd. will be changed to Central 2660.

Distributors.—T. Beadle and Co., Ltd., 3-5 Castle St., Hull, have been appointed distributors for Tilling-Stevens electric motors.

London office.—The London branch of Brook Motors, Ltd., has been moved to 16/18 Palmer St., Westminster, S.W.1 (Tel.: Abbey 7626), opposite the rear entrance to St. James's Pk. Tube Stn.

Battery Locos.—The Australian Comptroller-General of Customs has decided to remove storage battery locomotives of 8 tons and over from the provisions of entry under tariff item 449 (A) (1). The Commonwealth Tariff Board is to consider the question of what rate of duty shall be imposed on these locos, and U.K. firms interested should communicate with the Board of Trade, CRE Dept., Millbank, S.W.1.

NEW COMPANIES

Extracted from the Register issued by Jordan and Sons, Ltd., 116 Chancery Lane, London W.C.2.

Acme Electrical Manufacturing Co. (Tottenham) Ltd., Tariff Rd., Northumberland Park, N.17. To take over bus. of elec. engrs. cd. on as "The Acme Electrical Manufacturing Co." at Tottenham, N. Nom. cap.: £18,000. Dirs.: not named. Subs.: A. E. Wheeler and A. C. Wheeler.

Alcho Electric Co. Ltd., 53c Fulham High St., S.W.6. Nom. cap.: £500 in £1 shs. Dirs.: E. W. Chandler and J. P. Shannon.

Barrel and Clerkenwell Plating Ltd. To carry on bus. of metal polishing, electro and other plating, etc. Nom. cap.: £10,000 in £1 shs. Dirs.: W. G. Vidler, The Bungalow, Northaw, nr. Potters Bar, Middx., and H. J. Vidler.

County Electronics Ltd., 17 Stramongate, Kendal. Nom. cap.: £5,000 in £1 shs. Dirs.: J. Derham and H. Marshall.

Electro-Voice Products Ltd., 137, Harrowdene Rd., North Wembley, Middx. To carry on bus. of mnfrs. of transformers, acoustical and electronic equipment, etc. Nom. cap.: £1,000 in £1 shs. Dirs.: K. Jones and Vera G. Jones.

Frank L. Ridout Ltd., 191 Monument Rd., Edgbaston, Birmingham 16. To take over bus. of dlrs. in elec., radio and television equipment, cycles, toys and similar goods cd. on as "Frank L. Ridout" at Edgbaston, Birmingham Nom. cap.: £3,000 in £1 shs. Dirs.: F. L. Ridout and Doris M. Ridout.

G.E.S. Plating Co. Ltd., Royston Works, Royston Av., Southend-on-Sea. To take over bus. of metal finishers, electro platers and mnfrs. of domestic elec. appliances cd. on at Southend-on-Sea as "R.M.R. Industries." Nom. cap.: £3,000 in £1 shs. Dirs.: G. E. Sheil-Reid, Mrs. E. M. Sheil-Reid and Mrs. M. A. A. Simpson.

MEETINGS TO NOTE

THURSDAY, SEPT. 21

I.E.E. (N.E. Students' section).—Visit to Bushing Co. Ltd., Hebburn.

ENGINEERS' GUILD (Metropolitan branch).—Annual meeting. Lighting Service Bureau, Savoy Hill, W.C.2.—6.15 p.m.

TUESDAY, SEPT. 26

SYMPOSIUM ON INFORMATION THEORY.—(Until Sept. 29). Royal Society, Burlington House, Piccadilly, W.1.

WEDNESDAY, SEPT. 27

BRIT. INST. OF RADIO ENGRS.—Annual meeting at London School of Hygiene, Keppel St., W.C.1. 6.30 p.m.

THURSDAY, SEPT. 28

PURCHASING OFFICERS' ASSOC.—Annual national conference. Hotel Metropole, Brighton (until Oct. 1).

I.E.S. (Bradford group). "Cold Cathode Lighting Equipment." E. R. Langsdon, Elec. Board, Sunbridge Rd.—7.30 p.m.

SATURDAY, SEPT. 30

I.E.E. (N. Midland Students' section).—Chairman's Address. "Use of Electricity in Mines." B.E.A., 1 Whitehall Rd., Leeds.—2.30 p.m.

Thorn Electrical Industries

Success of Radio and Television

THE annual ordinary general meeting of Thorn Electrical Industries, Ltd., was held on September 12 in London.

Mr. Jules Thorn (chairman and managing director) presided, and in the course of his speech said:—

The net profit, before providing for taxation, amounted to £137,343. Net earnings thus improved by £32,348 over the previous year.

Our lighting division has again made progress in the incandescent field and is already among the first three manufacturers in this country.

In fluorescent lamps we have become the largest individual manufacturer in this country, and Atlas has built up for itself an international reputation.

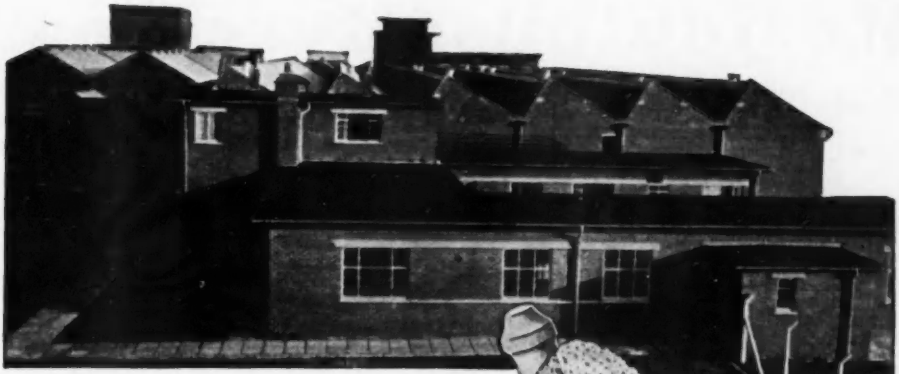
Your Company owns one of the only two lamp cap factories in the Empire. Apart from having enabled us to meet the growing demand of our own lamp factories, we have obtained large contracts from both home and overseas.

We have also acquired a 51% interest in the well-known Ekco-Ensign lighting organisation and there is little doubt that considerable benefit will result. Our co-operation with our American associates, Sylvania Electric Products Incorporated, is satisfactory.

Our export trade has continued to show satisfactory expansion during the past year.

Our Ferguson Television and Radio Division has experienced considerably increased demands since Radiolympia last year. In appearance, performance and price, all our models attracted an enormous amount of attention, and our sales were limited only by our inability to meet the demand.

The report was adopted.

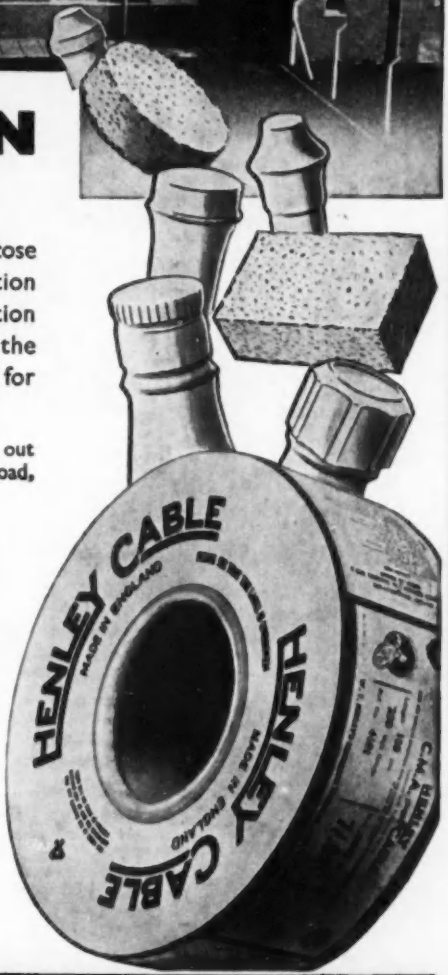


THIS MODERN FACTORY

in South Wales was erected for the Viscose Development Co. Ltd. for the production of VISKAPS and VISKRINGS. In addition to these well-known bottle closures, the factory produces SPONTEX sponges for Sponcel Ltd.

The electrical installation was carried out by Messrs. Grierson Ltd., 140 Cromwell Road, London, S.W.7, using Henley Cables.

General Contractors :
BENNETT BROS. (Contractors) LTD.
Architect : O. S. PORTSMOUTH, Esq.



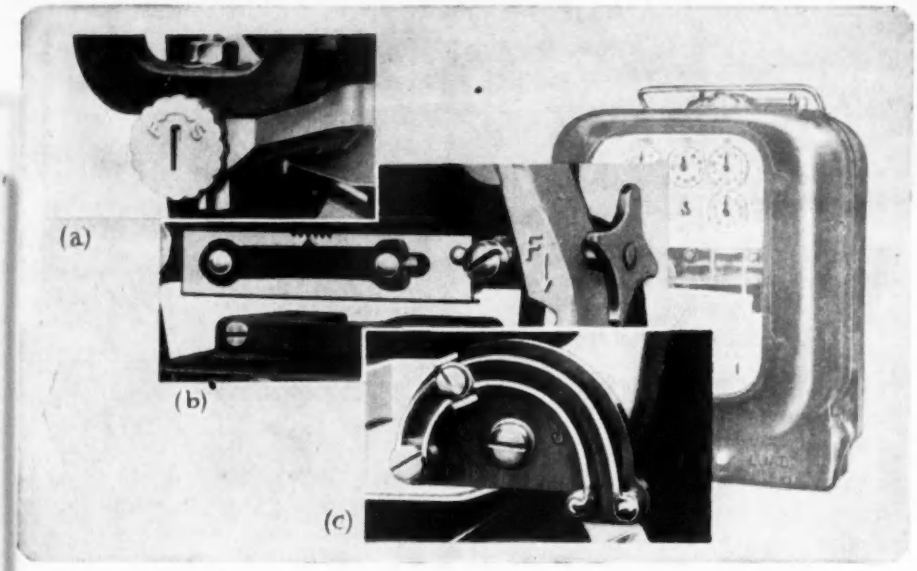
HENLEY CABLES

BY APPOINTMENT
ELECTRIC CABLE
MANUFACTURERS

W.T. HENLEY'S TELEGRAPH WORKS CO. LTD. 51-53 HATTON GARDEN, LONDON, E.C.1

Meticulous Metering

by the METROVICK TYPE NF Watt-hour Meter.



9—CALIBRATION ADJUSTMENTS

Type NF meters are designed for easy and accurate adjustment. Their adjusting devices are uncommonly accessible, positive in operation and free from backlash.

Full-load speed is precisely adjusted over a range of 40 per cent by turning a knob (Fig. a). **Low-load adjustments are made by turning a four-armed head** (Fig. b). **at the right-hand side of the meter, and inductive-load adjustment by moving a clamp along a resistance loop.** (Fig. c).

Other advertisements in this series:
2—CASES and COVERS: 3—PERFORMANCE: 4—REGISTERING MECHANISM: 5—DAMPING SYSTEM: 6—RESILIENT BEARING: 7—TEMPERATURE COMPENSATION: 8—ACCESSIBILITY and TERMINALS.

METROPOLITAN-VICKERS ELECTRICAL CO. LTD.

TRAFFORD PARK, MANCHESTER 17
Member of the A.E.I. Group of Companies

G/A009

CLASSIFIED ADVERTISEMENTS

OFFICIAL TENDERS AND APPOINTMENTS

WANTED · FOR SALE WORK WANTED

Those wishing to advertise in these pages should send the text to the Classified Advertisement Dept., Electrical Times, Sardinia House, Sardinia St., W.C.2, before 10 a.m. on TUESDAY of week of issue. Official Displayed Advertisements are charged at 35s. per inch, and all other classified advertisements at 2s. 6d. per line. Situations Wanted will be published four times for twice the single insertion rate. Fee for Box No. and postage on replies is 2s.

APPOINTMENTS VACANT

BRITISH ELECTRICITY AUTHORITY

London Division

DIVISIONAL H.Q.—SENIOR ASSISTANT ENGINEER IN THE DEPARTMENT OF THE CHIEF GENERATION ENGINEER (OPERATION)

APPLICATIONS are invited for the above position. Candidates must possess sound technical qualifications and have had operating experience in a large generating station, covering all sections of the plant.

The successful candidate will be required to co-ordinate technical information and to prepare reports covering both mechanical and electrical matters.

A comprehensive knowledge of the salary and wage agreements for the electricity supply industry is also desirable.

The commencing salary will be within the range of Class "AX," Grade 1, of the revised N.J.B. Agreement, i.e., £884 p.a. to £1,015 p.a., plus London allowance, and is subject to an ultimate maximum in Class "EX" of £1,141 p.a., plus London allowance.

Applications, in writing, stating age, qualifications and experience, should be addressed to the Divisional Secretary, British Electricity Authority, London Division, Ergon House, Horseferry Road, Westminster, S.W.1, to be received within fourteen days of the appearance of this advertisement.

J. N. WAITE,
Divisional Controller.
(G 151)

SOUTH WEST SCOTLAND ELECTRICITY BOARD

(Dumfries and Galloway Sub-Area)

APPOINTMENT OF DISTRICT ENGINEER

APPLICATIONS are invited for the post of District Engineer in the Kirkcudbright District of the Dumfries and Galloway Sub-Area. This district covers a rural area of 900 square miles.

Applicants should be corporate members of the Institution of Electrical Engineers and should have a sound technical training and be experienced in the planning, construction, operation, and maintenance of overhead and underground mains and sub-stations up to 33 kV.

The post is superannuable and the salary will be in accordance with the N.J.B. Schedule, Class "C," Grade 2, £769–£797 per annum.

Applicants will be required to reside in the district for which purpose a five-apartment house will be provided at a rental of £24 per annum.

Applications should be forwarded to the undersigned within 14 days from the date of this insertion.

W. H. WILLS,
Manager.

Marchmount, Dumfries.
September 16, 1950. (G 148)

SOUTH EASTERN ELECTRICITY BOARD

Area Board Headquarters

ENGINEERING DRAUGHTSMAN

PROVISIONAL salary £450 p.a., subject to negotiation with the appropriate body. Superannuation will be arranged. Applicants should have a good technical training and drawing office experience in the electrical design and layout of outdoor and indoor substations up to and including 33,000 V. Possession of the Ordinary and or Higher National Certificate will be an advantage.

Applications, giving two referees, must reach the Engineer-in-Chief, 10 Queen's Gardens, Hove 3, Sussex, by October 2, 1950.

A. L. BURNELL,
Secretary.
September, 1950. (G 152)

MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

APPOINTMENT OF SENIOR DEVELOPMENT ASSISTANT

(AMENDED ADVERTISEMENT)

APPLICATIONS are invited for the appointment of Senior Development Assistant, Sub-Area Commercial staff, at No. 3 Sub-Area Headquarters, Chester. The salary will be in accordance with Class "G," Grade 4 of the National Joint Board Schedule, i.e., £821 to £859 per annum.

Applicants must be Chartered Electrical Engineers, and have had wide experience in the commercial side of the supply industry, and development of industrial, commercial, rural and domestic supplies, contracting and consumers' service.

The successful candidate may be required to undergo a medical examination, and, if eligible, will be required to contribute to a superannuation scheme.

Applications must be made on a form to be obtained from the Manager, No. 3 Sub-Area, Merseyside and North Wales Electricity Board, Electricity House, Newgate Street, Chester, and should be returned to him in a sealed envelope, endorsed "Senior Development Assistant," so as to be received not later than October 9, 1950.

JAMES RANKIN,
Secretary.
(G 156)

MERSEYSIDE AND NORTH WALES ELECTRICITY BOARD

No. 3 Sub-Area (Chester)

APPOINTMENT OF DEMONSTRATOR

APPLICATIONS are invited for the appointment of a Female Demonstrator at No. 3 Sub-Area of the Board, based on Chester, at a salary within the range of £310 to £390 per annum, according to qualifications and experience, and in accordance with Grade 1 and service conditions of the Salary Agreement of the National Joint Council (Administrative and Clerical Grades) for the Electricity Supply Industry.

Applicants should hold a diploma in Domestic Science, or other approved certificate, and previous experience in the electricity supply industry will be an advantage.

The successful applicant may be required to satisfy the Board's Medical Adviser, and, if eligible, will be required to contribute to a superannuation scheme.

Applications must be made on a form obtainable by written request from the Manager, Merseyside and North Wales Electricity Board, No. 3 Sub-Area, Electricity House, Newgate Street, Chester, and should be returned to him not later than October 7, 1950.

JAMES RANKIN,
Secretary.
(G 157)

LONDON ELECTRICITY BOARD

METER REPAIRERS (MECHANICIANS)

APPLICATIONS are invited for the above vacancies at Dorset Rise, E.C.4, Lower Clapton Road, Hackney, E.5, and Eden Grove, Islington, N.7.

Applicants must be experienced in the repair and overhaul of all types of a.c. and d.c. meters.

Rates of pay and conditions of employment will be in accordance with the agreement of the National Joint Industrial Council for the electricity supply industry, the present rate being 3s. 3d. per hour, which amounts to £7 3s. per 44-hour 5-day week.

Application forms obtainable from Establishments Officer, 46 New Broad Street, E.C.2. Please quote ref. EST/V/813/7/T. (G 165)

BOX No. replies to be addressed to the ELECTRICAL TIMES, Sardinia House, Sardinia Street, London W.C.2

LONDON ELECTRICITY BOARD

JUNIOR ENGINEERS

APPLICATIONS are invited for positions as Junior Engineers in the Western Sub-Area, initially, in the Testing Department based at Fulham, but applicants must be prepared to work anywhere in the Sub-Area and will be required to participate in standby duties.

Applicants should have received a sound general and technical education at least to the Graduate I.E.E. standard. They should have completed an engineering apprenticeship with an electrical manufacturer or supply authority, and should have sound practical experience in three-phase h.v. and l.v. distribution.

Pending classification and grading of the posts under the revised agreement of the National Joint Board, commencing salaries will be from £400 per annum inclusive, dependent on qualifications and experience.

Application forms, obtainable from Establishments Officer, 46 New Broad Street, E.C.2, on receipt of an addressed foolscap envelope, to be returned, duly completed, not later than October 2, 1950. Please quote EST/V/962/T on envelope and all correspondence. (G 149)

BRITISH ELECTRICITY AUTHORITY

South Wales Division

APPLICATIONS are invited for the appointment of SHIFT CHARGE ENGINEER at Llynfi Power Station, Aberkenfig, at a salary in accordance with the National Joint Board Revised Agreement, Class "F," Grade 7 (£625-£643 per annum).

When the extensions at present under construction at this station are completed, the classification will be increased to Class "G," and the salary will then be £651-£679 per annum.

Applicants should preferably have served a regular apprenticeship, obtained the Higher National Certificate, and had previous operational experience in a modern generating station.

The appointment will be superannuable under the British Electricity Authority and Area Boards Scheme.

Forms of application may be obtained from the Divisional Secretary at the address below, to whom completed applications should be returned not later than September 25, 1950, in sealed envelope endorsed "Shift Charge Engineer, Llynfi."

H. V. PUGH,
Divisional Controller.

Cardiff (Pengam Moors) Airport,
Cardiff.
September 8, 1950. (G 120)

BRITISH ELECTRICITY AUTHORITY

London Division

APPLICATIONS are invited for the position of SHIFT CHARGE ENGINEER at Taylors Lane Generating Station.

Applicants should have technical qualifications up to Higher National Certificate standard, including thermodynamics as a subject, together with a good general education. Experience in the operation of a modern power station is essential. Character and ability to deal with staff problems is important.

Salary in accordance with the revised N.J.B. Agreement, Class "F," Grade 7, £656 5s. per annum, including London Area allowance.

The appointment will be subject to the provisions of the B.E.A. and Area Boards Superannuation Scheme.

Applications, stating age, qualifications, and experience, should be addressed to the Divisional Secretary, British Electricity Authority, London Division, Ergon House, Horseferry Road, Westminster, S.W.1, to be received within 14 days of the appearance of this advertisement.

J. N. WAITE,
Divisional Controller.
(G 117)

BRITISH ELECTRICITY AUTHORITY

North Western Division

APPLICATIONS are invited for the position of ASSISTANT in the Internal Audit Section of the Divisional Accountant's Department.

Candidates should have had experience in a large undertaking, preferably electricity, and should be capable of concise and accurate reporting. Possession of a recognised accountancy qualification will be an advantage.

The salary will be in accordance with Grade 4 of the National Joint Council Salary Agreement, i.e., £510 to £570 per annum.

Applications, stating age, and giving full details of qualifications, education, and experience, together with the names of two referees, should be received by The Establishment Officer, British Electricity House, Wilmslow Road, East Didsbury, Manchester 20, not later than September 30, 1950. (G 127)

CROWN AGENTS FOR THE COLONIES

ELECTRICAL FITTER required by the Nyasaland Government Electrical Services Department, for one tour of 24 months to 36 months with prospect of permanency. Commencing salary, according to age and experience in scale, £570, rising to £740 a year. Cost-of-living allowance between £26 and £90 a year, according to salary and dependants. Outfit allowance, £30. Free passages. Liberal leave on full salary. Candidates, between 23 and 30 years of age, must have served an apprenticeship to electrical engineering with a firm of manufacturers or an electricity supply undertaking, and possess some theoretical knowledge. They should be capable of erecting and maintaining low tension and high tension switchgear, transformers, motors and generators, and should have had some experience of overhead or underground distribution work. Preference will be given to candidates who have had experience of electrical supply in a rural area. Some experience of electric welding an advantage.

Apply at once by letter, stating age, full names in block letters, and full particulars of qualifications and experience, and mentioning this paper, to the Crown Agents for the Colonies, 4 Millbank, London S.W.1, quoting M.N/25647/3B on both letter and envelope. The Crown Agents cannot undertake to acknowledge all applications and will communicate only with applicants selected for further consideration. (G 144)

BRITISH ELECTRICITY AUTHORITY

South Eastern Division

APPLICATIONS are invited for the position of METER REPAIRER (Mechanician) in the Operation Department at Divisional Headquarters, Kingston-upon-Thames.

Applicants should have served a recognised apprenticeship in instrument repair and maintenance, should have had at least five years' experience on high-grade work as an instrument mechanic on electrical instruments, temperature and pressure recorders, flow meters, and $C.O._2$ equipment.

The successful applicant will be based at Divisional Headquarters, but will be required to work on instrument repair and maintenance throughout the medium and small power stations in the Division.

Conditions of service and rate of pay will be in accordance with the N.J.I.C. Agreement at present 3s. 3d. per hour, or £7 3s., inclusive of London allowance, for a 44-hour week.

Letters of application, giving full details of age, present position, and past experience, should be posted to the Divisional Secretary, British Electricity Authority, South Eastern Division, British Electricity House, Lower Ham Road, Kingston-upon-Thames, Surrey, together with copies of two recent testimonials, to arrive not later than October 2, 1950. (G 122)

BRITISH ELECTRICITY AUTHORITY

Southern Division

APPLICATIONS are invited for the following positions at Portsmouth Generating Station:

1. SHIFT CHARGE ENGINEER. (£651-£679).
2. ASSISTANT SHIFT CHARGE ENGINEER. (£571-£597).

Applicants should preferably be in possession of technical qualifications admitting to corporate membership of a recognised professional Institution, have had previous experience in a large modern generating station, and also have had manufacturing works experience.

Applications for forms, stating for which post applicants wish to apply, should be addressed to the undersigned. Completed application forms must be returned by October 6, 1950.

These appointments are superannuable and subject to a satisfactory medical examination.

P. D. A. OLIVER,
Divisional Secretary.

British Electricity House,
111 High Street, Portsmouth. (G 154)

SOUTH WALES ELECTRICITY BOARD

APPLICATIONS are invited for the position of SUB-AREA COMMERCIAL OFFICER in the Eastern Sub-Area of the Board, based on Newport, Mon.

The post entails the co-ordination of duties normal to the District Commercial Departments of the Sub-Area, including development of supply, application of tariffs, negotiation of agreements and contracts, public lighting, wiring and contracting work, showrooms, sales and demonstration service, etc.

The salary for the position will be provisional and will be within the range £1,000-£1,200, the actual rate being determined according to qualifications and experience.

Applications, stating age, present position, present salary, qualifications and experience, and whether married or single, together with the names and addresses of three referees, should be addressed to the Secretary: Establishments Section, The South Wales Electricity Board, St. Mellons, near Cardiff, so as to reach him not later than October 7, 1950. (G 143)

BRITISH ELECTRICITY AUTHORITY

London Division

APPLICATIONS are invited for the following appointments in the GENERAL SECTION of the TECHNICAL DEPARTMENT at DIVISIONAL HEADQUARTERS: GENERAL ASSISTANT ENGINEERS.

Applicants should have a Degree or Higher National Certificate or equivalent, and should preferably have had experience in the manufacture and testing of electrical equipment used in generating stations and on high voltage transmission systems. Experience in the commissioning and maintenance of such equipment, including protective gear, will be an added qualification.

The appointments will be Grade 8, Schedule C, of the National Joint Board Agreement, and the salary will be within the range £437/£641 per annum, plus 5 per cent. or £25 per annum, whichever is the greater, London Area allowance.

The appointments will be superannuable under the terms of the British Electricity Authority and Area Boards Superannuation Scheme.

Applications for the foregoing vacancies, stating age, qualifications and experience, should be addressed to the Divisional Secretary, British Electricity Authority, London Division, Ergon House, Horseferry Road, Westminster, S.W.1, to be received within fourteen days of the appearance of this advertisement.

J. N. WAITE,
Divisional Controller.
(G 118)

NORTH WESTERN ELECTRICITY BOARD

No. 2 Sub-Area

SECOND ASSISTANT ENGINEER (SYSTEM PLANNING AND DEVELOPMENT)

APPLICATIONS are invited for the appointment of a Second Assistant Engineer in the System Planning and Development Section of the Technical Engineer's Department, No. 2 Sub-Area Headquarters, National Buildings, St. Mary's Parsonage, Manchester 3.

The salary for the post will be in accordance with the Revised National Joint Board Agreement, Class "L," Grade 7, i.e., £841-£961-£881 per annum.

Candidates must have had a sound training in electrical engineering to degree or Higher National Certificate standard and responsible experience in several of the following branches:—

(1) Planning and construction of 33 kV and lower voltage systems.
(2) Maintenance and operation of 33 kV and lower voltage systems.
(3) Substation design and construction.
(4) Calculation of fault levels, etc.
(5) Application of protective gear.
(6) Planning and installation of telecommunication, supervisory and ripple control equipment.
(7) Estimating and specification of distribution plant.

Applications, stating age, and giving full details, with relevant dates of training and experience, qualifications, present post and salary, should be received by E. G. Wardle, A.M.I.E.E., Sub-Area Manager, No. 2 Sub-Area, National Buildings, St. Mary's Parsonage, Manchester 3, not later than Saturday, October 7, 1950. (G 116)

BRITISH ELECTRICITY AUTHORITY

Eastern Division

APPLICATIONS are invited for the following appointment:

ASSISTANT EFFICIENCY ENGINEER
Little Barford Generating Station

Salary in accordance with the revised N.J.B. Schedule, Grade 9, Class "G" (£571 to £597 per annum), but may be subject to negotiation through the N.J.B.

Applicants should hold associate membership qualifications of the Institutions of Mechanical or Electrical Engineers or other equivalent qualifications and have had previous experience in a large generating station.

A knowledge of instrument maintenance and calibration is desirable and preference will be given to candidates who have had experience with P.F. equipment.

The successful applicant will be required to assist in ensuring that all sections of the generating station plant attain efficiency and economy of operation, the preparation of statistics and the keeping of technical records.

The appointment will be superannuable in accordance with the British Electricity Authority and Area Boards Superannuation Scheme.

Applications, stating age, experience and present position, should be sent to the Divisional Controller, British Electricity Authority, Eastern Division, Northmet House, Southgate, N.14, to arrive not later than October 6, 1950. Envelopes should be endorsed "Assistant Efficiency Engineer—Little Barford."

W. N. C. CLINCH,
Controller.

Northmet House,
Southgate, N.14. (G 158)

TRINIDAD AND TOBAGO ELECTRICITY COMMISSION

SHIFT ENGINEER

APPLICATIONS are invited for the appointment of Shift Engineer at the Commission's Power Stations in Trinidad.

The Port of Spain Power Station consists of 12,500 kVA of steam turbo alternators with water tube boilers 425 p.s.i., 740° F and 7,400 kVA of diesel generating plant. The Penal Power Station will have an initial capacity of 10,000 kVA steam turbine plant, and the two stations will be inter-connected through a 66 kV transmission line.

Applicants must be not more than 35 years of age, and have served an apprenticeship in mechanical engineering or a pupilage in a power station and have had subsequent experience in the operation of steam turbine and water tube boilers, experience in the operation of diesel engines is desirable but not essential. Applicants must be capable of taking charge of a shift in any of the Commission's power stations after a short period in which to become familiar with the plant.

The salary of the appointment is in the scale $2,880 by $120 to $3,840 by $240 to $4,080 per annum (£1=$4.80 B.W.I.) (equivalent to £600 p.a., increasing by £25 p.a. to £800 p.a. with one increment of £50 to £850 p.a.) subject to satisfactory service.

Furnished quarters at moderate rentals or a rent allowance in lieu are provided under the Commission's regulations.

Free passages are provided for the officer and family, not exceeding four persons.

An outfit allowance of $288 (£60) will be granted on first appointment.

The appointment is subject to an agreement for three years in the first instance, and medical examination by the Commissioners' medical adviser.

Applications endorsed "Shift Engineer, Trinidad," stating age, marital status, family, nationality, general and technical education, apprenticeship, appointments held, and full details of power station experience, with references, to be submitted to the undersigned within 21 days from the date of this advertisement.

PREECE, CARDEW AND RIDER.
8 and 10 Queen Anne's Gate,
Westminster, S.W.1. (G 167)

BRITISH ELECTRICITY AUTHORITY

London Division

STATION SUPERINTENDENT—BLACKWALL POINT GENERATING STATION

APPLICATIONS are invited for this position at Blackwall Point Generating Station, River Way, Greenwich, S.E.10, which, when completed, will have a capacity of 90 MWS.

Candidates should have received a sound technical and practical training in electrical and mechanical engineering, followed by a wide experience in the operation and maintenance of generating station plant.

They should also have had experience of administration and have had a successful record in dealing with works management and labour relations.

The successful applicant will be responsible for the efficient local management and operation of the station, and will be in control of the technical, operating, maintenance, and administrative staffs.

The salary and conditions of service will be in accordance with the revised N.J.B. Schedule, Class "F," Grade 1, plus London allowance (£1.048 19s. per annum).

Applications, stating age, qualifications, and experience, should be addressed to the Divisional Secretary, British Electricity Authority, London Division, Ergon House, Horseferry Road, Westminster, S.W.1, to be received within 14 days of the appearance of this advertisement.

J. N. WAITE,
Divisional Controller.
(G 150)

SOUTH WESTERN ELECTRICITY BOARD

THE position of MANAGER of the Board's Cornwall Sub-Area becomes vacant early in the new year and applications are now invited for this appointment.

The Sub-Area Manager will be responsible for the interpretation and supervision of the Board's policy throughout the Sub-Area and for the direction and co-ordination of the work of the administrative, commercial and engineering staff of the Sub-Area, which has 5 districts and 22 branch offices, a population of 320,000 and an area of 1,249 square miles. The Sub-Area headquarters are at Pool, near Redruth, Cornwall. The salary attached to the appointment is between £1,850 and £2,000 per annum according to qualifications and experience. The successful applicant will be subject to the Board's provisional conditions of employment.

The post calls for considerable administrative ability and applicants should be chartered electrical engineers and have had wide commercial and engineering experience. In view of the character of the Sub-Area, experience in modern rural electrical development will be an advantage.

Applications should be submitted to the Secretary, South Western Electricity Board, Electricity House, Colston Avenue, Bristol, 1, marked "S.A.M., Cornwall," within 10 days of the publication of this notice.

September 14, 1950. (G 169)

SOUTH WALES ELECTRICITY BOARD

APPLICATIONS are invited for the following positions in the Central and Eastern Sub-Areas of the Board:—

(1) ASSISTANT ENGINEER, District 463 (Monmouth), Eastern Sub-Area. Salary, Class "B," Grade 7 (£492-£505-£518), N.J.B. Schedule.
(2) FIRST ASSISTANT DISTRICT ENGINEER, District 465 (Brecon, Hay), Eastern Sub-Area. Salary, Class "B," Grade 4 (£588-£607-£626), N.J.B. Schedule.
(3) ASSISTANT ENGINEER (Mains Construction), Central Sub-Area (Cardiff). Salary, Class "K," Grade 10 (£546-£560-£574), N.J.B. Schedule.
(4) ASSISTANT ENGINEER (Mains), District 348 (Cardiff), Central Sub-Area. Salary, Class "D," Grade 7 (£563-£563-£573), N.J.B. Schedule.
(5) ASSISTANT ENGINEER (Sub-stations), District 348 (Cardiff), Central Sub-Area. Salary, Class "D," Grade 7 (£563-£563-£573), N.J.B. Schedule.
(6) ASSISTANT ENGINEER (Mains), District 347 (Cardiff), Central Sub-Area. Salary, Class "F," Grade 7 (£625-£634-£643), N.J.B. Schedule.
(7) ASSISTANT ENGINEER, District 346 (Porth), Central Sub-Area. Salary, Class "E," Grade 7 (£579-£594-£609), N.J.B. Schedule.
(8) ASSISTANT ENGINEER (Mains Testing), Central Sub-Area (Cardiff). Salary, Class "K," Grade 13 (£515-£528-£537), N.J.B. Schedule.
(9) ASSISTANT ENGINEER, District 349 (Barry and Penarth), Central Sub-Area. Salary, Class "C," Grade 10 (£438-£447-£456), N.J.B. Schedule.
(10) ASSISTANT ENGINEER (Mains), District 345 (Pontypridd), Central Sub-Area. Salary, Class "D," Grade 8 (£524-£533-£542), N.J.B. Schedule.
(11) ASSISTANT ENGINEER (Underground Mains), District 341 (Aberdare, Hirwaun, Mountain Ash), Central Sub-Area. Salary, Class "D," Grade 9 (£494-£502-£510) N.J.B. Schedule.

Preference will be given to applicants who possess an engineering degree of a British university, the Higher National Certificate, or its equivalent, or have passed the Graduateship Examination of the Institution of Electrical Engineers.

Applicants are requested to state clearly for which position they are applying, and when applying for more than one position to submit copies of their application in each instance.

Applications, stating age, present position, present salary, qualifications and experience, and whether married or single, together with the names and addresses of three referees, should be addressed to the Secretary (Establishments Section), The South Wales Electricity Board, St. Mellons, near Cardiff, so as to reach him not later than September 30, 1950. (G 131)

BRITISH ELECTRICITY AUTHORITY

South Western Division

ASSISTANT SHIFT CHARGE ENGINEER
PLYMOUTH "A" GENERATING STATION

APPLICATIONS are invited for the position of Assistant Shift Charge Engineer at Plymouth "A" Generating Station, Class "F," Grade 9, £538-£560 per annum.

Candidates should have had a sound general and technical education up to Higher National Certificate standard, and have had experience in the operation of steam power stations.

Salary and conditions of service will be in accordance with the National Joint Board Agreement.

The appointment will be superannuable under the British Electricity Authority and Area Boards' Superannuation Scheme.

Applications, stating age, qualifications, experience, present appointment and salary, should be addressed to the Divisional Secretary, British Electricity Authority, South Western Division, British Electricity House, 26 Oakfield Road, Bristol 8, so as to be received not later than October 6, 1950.

R. C. BARRETT,
Divisional Secretary.

September 14, 1950. (G 129)

BRITISH ELECTRICITY AUTHORITY

Midlands Division

APPLICATIONS are invited for the position of ASSISTANT SHIFT CHARGE ENGINEER at Walsall Generating Station, Class "G," Grade 9, commencing salary £571 per annum.

Applicants should possess the National Certificate in mechanical engineering or equivalent qualifications and should have had sound technical training. Experience in power-station operation will be considered an advantage.

Salary and conditions of service will be in accordance with the N.J.B. Agreement, and superannuation under terms approved by the British Electricity Authority.

Applications should be made on forms which may be obtained from the Divisional Establishments Officer, 53 Wake Green Road, Moseley, Birmingham 13, and be returned not later than October 7, 1950.

F. W. LAWTON,
Divisional Controller.
(G 126)

TRINIDAD AND TOBAGO ELECTRICITY COMMISSION

RESIDENT ENGINEER

APPLICATIONS are invited for the appointment of Resident Engineer to the Trinidad and Tobago Electricity Commission.

The Commission has under construction a new power station at Penal, consisting initially of two 5,000 kVA turbo alternator sets with two water tube boilers and ancillary equipment, which will be interconnected through a 66 kV transmission line with the Port of Spain power station of 19,900 kVA capacity. A diesel engine power station is to be constructed on the Island of Tobago.

The engineer appointed will be responsible for the setting out and supervision of the erection of the power station buildings, foundations, concrete and steel construction connected therewith, the erection of water tube boilers, turbo alternators, cooling towers, switchgear and all ancillary equipment.

Applicants must be not more than 40 years of age and be fully qualified engineers with considerable experience in the work outlined above.

The salary of the appointment is in the scale $6,480-$240-$6,960 per annum (£1=$4.80 B.W.I.) (equivalent to £1,350-£50-£1,450 p.a.), subject to satisfactory service.

Furnished quarters at moderate rentals or a rent allowance in lieu are provided under the Commission's Regulations.

Free passages are provided for the officer and family not exceeding four persons.

An outfit allowance of $288 (£60) will be granted on first appointment.

The appointment is subject to an agreement for a period of three years and medical examination by the Commission's medical adviser.

Applications, endorsed "Resident Engineer, Trinidad," stating age, marital status, family, nationality, general and technical education, qualifications and experience, and full particulars of appointments held, with references, to be submitted to the undersigned within 21 days from the date of this advertisement.

PREECE, CARDEW, AND RIDER.
8 and 10 Queen Anne's Gate,
Westminster, S.W.1. (G 166)

LONDON ELECTRICITY BOARD

TECHNICAL ASSISTANTS—DESIGN AND PLANNING BRANCH

APPLICATIONS are invited for two vacancies as Technical Assistant in the Design and Planning Branch of the Western Sub-Area at 25 Eccleston Place, S.W.1.

Applicants should have received a sound general and technical education at least to the Graduate I.E.E. standard. They should have completed an engineering apprenticeship with an electrical manufacturer or supply authority, and should have sound practical experience in 3-phase, h.v. and l.v. distribution, with a knowledge of network and sub-station design and layout, with associated calculations and estimates. The duties may include the compilation of statistics and records of the electrical systems in the Sub-Area.

Pending classification and grading of the posts under the revised agreement of the National Joint Board, commencing salaries will be from £650 per annum, dependent on qualifications and experience.

Application forms obtainable from Establishments Officer, 46 New Broad Street, E.C.2, on receipt of an addressed foolscap envelope, to be returned, duly completed, not later than October 2, 1950. Please quote EST/V/760/T on envelope and all correspondence. (G 145)

NORTH WESTERN ELECTRICITY BOARD

No. 3 Sub-Area

GENERAL ASSISTANT ENGINEER
(ASSISTANT DISTRICT INSTALLATION INSPECTION ENGINEER)

APPLICATIONS are invited for the appointment of a General Assistant Engineer (Assistant District Installation Inspection Engineer) in the Stalybridge District of the No. 3 Sub-Area.

The salary for the post will be in accordance with the National Joint Board Revised Agreement, Class "F," Grade 12, i.e., £443-£451-£459 per annum.

Applicants should have had experience of the following work:

(1) The inspection and testing of all classes of electrical installations.
(2) Negotiations with electrical contractors.
(3) Routine meter fixing procedure.
(4) Office organisation in connection with installation inspection and meter fixing.

Applicants should have a good knowledge of the Regulations for the Electrical Equipment of Buildings and other statutory regulations relating to electrical installations, and should have had experience in the control of workmen.

Applications, stating age, training, qualifications and experience, present post and salary, should be received by E. Binns, M.I.Mech.E., A.M.I.E.E., Sub-Area Manager, the North Western Electricity Board, No. 3 Sub-Area Headquarters, Union Street, Oldham, not later than Saturday, October 14, 1950. (G 153)

BRITISH ELECTRICITY AUTHORITY

East Midlands Division

DRAUGHTSMEN

APPLICATIONS are invited for positions as Draughtsmen at the Divisional Headquarters, Barker Gate, Nottingham, from persons with experience in one or more of the following branches of work in connection with the construction of generating stations.

(a) ELECTRICAL ENGINEERING. (i) General design, assembly and layouts of h.t. and auxiliary switchgear, transformers cables.

(b) MECHANICAL ENGINEERING. With experience on the layout and design of conveyor plant. Coal handling equipment and material handling of station auxiliaries.

(c) CIVIL ENGINEERING. With experience on the design and or details of reinforced concrete structures, piled foundations, retaining walls, etc., associated with light and heavy plant installations.

The salary will provisionally be within the range £450 to £550 per annum.

The salary range quoted is to be regarded as provisional until final scales have been negotiated with appropriate organisations, and superannuation will be under terms approved by the British Electricity Authority.

Applications must be submitted on the official form, which may be obtained from the Divisional Establishments Officer, British Electricity House, Barker Gate, Nottingham, and should be returned not later than October 23, 1950.

W. S. BURGE,
Divisional Controller.

British Electricity House,
Barker Gate, Nottingham. (G 155)

BRITISH ELECTRICITY AUTHORITY

North Western Division

APPLICATIONS are invited for the undermentioned posts at the new Westwood Generating Station, Wigan.

The present capacity of the Station is 90 MW, and salaries will be in accordance with Class "F" of the revised N.J.B. Agreement. The ultimate capacity will be 120 MW.

POWER STATION SUPERINTENDENT. Grade 1 (£999-£1,045).

Applicants should be fully qualified engineers with practical experience in the administration, operation, and maintenance of a modern steam generating station. A knowledge of P.F. fired high pressure boilers would be an advantage.

DEPUTY POWER STATION SUPERINTENDENT. Grade 3 (£827-£865).

Applicants should be qualified engineers with a good technical education and practical experience in the operation and maintenance of a modern steam generating station.

In both cases it is preferable that applicants be Corporate members of the Institution of Mechanical Engineers or Institution of Electrical Engineers, or have equivalent qualifications.

5 SHIFT CHARGE ENGINEERS. Grade 7 (£625-£643).

5 STATION SHIFT CONTROL ENGINEERS. Grade 10 (£510-£530).

Practical experience in the duties involved, and possession of technical qualifications is desirable.

Applications, stating age, experience, qualifications and present position, should be sent to the Establishment Officer, British Electricity House, Wilmslow Road, East Didsbury, Manchester 20, not later than October 7, 1950. (G 146)

BRITISH ELECTRICITY AUTHORITY

South Eastern Division

APPLICATIONS are invited for the position of SECOND ASSISTANT ENGINEER (System Development) in the Divisional Technical Engineer's Department at Divisional Headquarters, Kingston-upon-Thames.

Applicants should have experience in the calculation of symmetrical and unsymmetrical short circuits, load flows, and voltage regulations, and be capable of analysing the incidence and rate of growth of load, and preparing long-term schemes for reinforcement and extension of transmission systems and substations.

Applicants should preferably be corporate members of the Institution of Electrical Engineers and possess a degree in electrical engineering.

The commencing salary will be in the range of £789 12s. per annum to £928 per annum, in accordance with Class "AX," Grade 2, and rise to a maximum of £984 18s. per annum in accordance with Class "CX," Grade 2 of Schedule C of the N.J.B. Agreement. These salaries are inclusive of London allowance.

Forms of application may be obtained by sending a stamped addressed foolscap envelope to the Divisional Secretary, British Electricity Authority, South Eastern Division, British Electricity House, Lower Ham Road, Kingston-upon-Thames, Surrey, and should be returned completed, together with copies of two recent testimonials, not later than October 5, 1950. (G 121)

BRITISH ELECTRICITY AUTHORITY

Generation Construction Branch Headquarters London

SENIOR ASSISTANT ENGINEER (ELECTRICAL)

APPLICATIONS are invited for the position of Senior Assistant Engineer (Electrical) in the production, inspection and test section of the Generation Construction Branch at Headquarters in London.

Applicants should have recent first-hand experience of production methods, test and inspection work in manufacturers' works in connection with plant and equipment for modern power stations, and full details (with dates) of such experience must be sent with the application. It is also desirable that applicants should have knowledge and experience of actual constructional and plant erection work at power stations and have attended site progress meetings.

The commencing salary for the appointment, which is superannuable, will be within Grade 1, Class "AX," of the N.J.B. Agreement, £912 per annum to £1,169 per annum including London allowance, according to qualifications and experience. This salary scale rises ultimately to a maximum of £1,285 per annum, including London allowance.

Application forms may be obtained from the Secretary's Office (Establishments), and should be completed and returned to D. Moffat, Director of Establishments, British Electricity House, Great Portland Street, London W.1, so as to be received not later than October 7, 1950. Please quote reference AE/97). (G 119)

SOUTH EAST SCOTLAND ELECTRICITY BOARD

(Lothians Sub-Area)

VACANCIES exist at the Lothians Sub-Area Headquarters for:

(a) THIRD ASSISTANT COMMERCIAL ENGINEER
(b) JUNIOR COMMERCIAL ENGINEER

Applicants should have received a good general and technical education and possess the Higher National Certificate. A sound knowledge of electrical contracting work, showroom organisation, and the application of electricity to water and space heating are desirable.

Conditions of service and salary will be in accordance with the National Joint Board Agreement, the salary being for these posts:

(a) Class "G," Grade 13, £433-£441-£499 per annum.
(b) Class "G," Grade 15, £392-£399-£406 per annum.

The appointment to the senior post will be made, having regard to the extent of the applicant's experience.

The successful applicant will require to be medically examined and, if acceptable, contribute to this Area Board's Superannuation Scheme.

Applications, stating age, education, qualifications, details of training and experience, should be sent to the Manager, Lothians Sub-Area, South-East Scotland Electricity Board, Musselburgh, Midlothian, not later than October 16, 1950. (G 147)

ASSISTANT ENGINEER required with experience in the sagging of overhead line profiles and the preparation of pole schedules, etc. Very good prospects for energetic man who will also be required to direct the activities of field survey staff. Full details of experience, age, etc., with copy references, to Box No. 1705, Electrical Times. (G 138)

CABLE JOINTERS for work on 33-kV installations required immediately. Must be prepared to work in any part of the United Kingdom.—Apply, stating age and giving details of experience, to Box No. 1697, Electrical Times. (G 132)

CONTROL ENGINEERS

CONTROL ENGINEERS for network operation required by Major Oil Company in Middle East for control centre covering operation of extensive overhead and underground transmission and distribution networks up to 66 kV. Applicants must possess Ordinary or Higher National Certificate in Electrical Engineering, and must be experienced in the operation of indoor and outdoor metal-clad switchgear at all voltages, transformers and associated substation equipment. Age not over 35. Attractive salary, plus generous allowance in local currency, free passages out and home, free medical attention, kit allowance, good leave arrangements, Pension Scheme.—Write, giving personal particulars and details of qualifications and experience, quoting:

DEPARTMENT F.116 TO BOX NO. 2584 AT 191 GRESHAM HOUSE, E.C.2. (E 389p)

LEE, BEESLEY & CO. LTD.
(GLOUCESTER)

A vacancy exists for a COST ACCOUNTANT to take complete charge of office staff associated with electrical contracting and manufacturing costs. Applicants to be fully conversant with the electrical industry and competent to finalise accounts.

Applications, in writing, stating experience and salary required, to

The Managing Director, Lee, Beesley & Co. Ltd., 6 Warwick Row, Coventry. (G 134p)

APPLICATIONS for position of SENIOR RESIDENT ENGINEER are invited by consulting engineers to supervise the erection and commissioning of a large power station in S.W. England. Must have previous constructional and operating experience of large high-pressure boilers, turbo-alternators, and ancillary plant, and of the administration and co-ordination of the constructional side of plant contracts. Applications should state age, qualifications, salary required, and previous experience, and should give the names of not less than two referees.—Box No. 1695, Electrical Times. (G 124)

DEMONSTRATORS. Applications are invited for the position of Housecraft Demonstrator in London, Birmingham, Manchester, and Scottish areas. Candidates should be fully qualified to lecture and advise on the utilisation of electric cookers, refrigerators, washing machines, and food mixers, and to give demonstrations in showrooms and at exhibitions. Possession of the E.A.W. or Domestic Science Diploma would be an advantage.—Applications, together with particulars of experience and salary required, should be submitted to Box No. 1693, Electrical Times. (G 123)

DRAUGHTSMAN with experience of large transformer manufacture required by electrical engineering company in North-East London. Permanent position, with superannuation scheme, for suitable applicant. Good salary and working conditions. Write, stating age, experience and salary required, to Box No. 1685, Electrical Times. (G 63)

DRAUGHTSMAN, age 22-23, for detailing small mechanism. Interesting work; good conditions.—Write, giving full details of experience, etc., to Box No. 1671, Electrical Times. (G 13)

DRAUGHTSMEN with experience in the fabrication of large steel tanks and vessels required by electrical engineering company in North-East London. Permanent position, with superannuation scheme, for suitable applicants. Good salary and working conditions.—Write, stating age, experience and salary required, to Box No. 1687, Electrical Times. (G 64)

ELECTRICAL DRAUGHTSMAN required for work on new distribution system with possibility of permanency for suitable man. Experience of large industrial plant electrical layouts, diagrams and specifications is desirable.—Applications, giving age, personal particulars and experience, to be addressed to National Oil Refineries, Limited, Llandarcy, Neath, Glamorgan. Envelope to be marked "Electrical Draughtsman." (F 727)

ELECTRICAL DRAUGHTSMAN required by major oil company for service in the Middle East. Must have served five years electrical engineering apprenticeship, and have had five years D.O. experience in connection with electrical layouts of large industrial plants with underground cable networks. Should possess Higher National Certificate. Graduate or associate membership of a corporate engineering body desirable but not essential. Maximum age limit 35 years. Attractive salary plus generous allowance in local currency. Free passages out and home, free medical attention, kit allowance, good leave arrangements. Pension scheme.—Write, giving personal particulars and details of qualifications and experience, quoting Dept. F.192, to Box No. 2009, at 191 Gresham House, Old Broad Street, E.C.2. Applicants without above requirements will not be considered. (F 322)

ELECTRICAL wiring accessories. CHIEF DESIGNER wanted to take charge of development and engineering in an established organisation in the London area. Applicants should have had several years' experience in a responsible position of design work in both its electrical and mechanical aspects.—Write, giving full details of past experience and salary required to Box No. D.9038, A. K. Advr., 212a Shaftesbury Avenue, W.C.2. (G 96)

ELECTRICAL ENGINEERS required for service in Middle East. Applicants should (a) possess Ordinary or Higher National Certificate and have had full apprenticeship with heavy electrical equipment manufacturers or with a large colliery or allied fully electrified industry, or (b) possess a degree and have had two years' technical apprenticeship with similar firm to above. In each case applicants must have had at least three years' subsequent experience on the installation and maintenance of heavy electrical equipment. Maximum age limit 35 years. Attractive salary, plus, generous allowance in local currency, free passages out and home, free medical attention, kit allowance, good leave arrangements. Pension scheme.—Write, giving particulars and details of qualifications and experience, quoting Dept. F.191, to Box No. 2916 at 191 Gresham House, E.C.2. (G 19)

DRAUGHTSMEN, with knowledge of general electrical design work. Workshop training desirable. Permanent position with superannuation scheme. Salary according to age and qualifications.—Apply, in writing, to the Staff Officer, British Insulated Callender's Cables Ltd., Prescot, Lancs. (G 97)

MAJOR oil company has vacancies for three ENGINEERS in its purchasing departments. Applicants, preferably under 30 years of age, should have Higher National Certificates, or equivalent, and have served an apprenticeship. Experience in sales with manufacturing supply company or consultants is desirable. There is one vacancy in each of the following sections and applicants should make it clear for which post they are applying: (a) Electrical; (b) Mechanical; (c) Structural.—Reply, giving full details, and quoting Department M. 1366, to Box No. 5939, at 191 Gresham House, E.C.2. (G 125)

OLD-ESTABLISHED manufacturers of electrical plant and steam turbines have vacancies for TECHNICAL SALES ENGINEERS for responsible positions in new organisation covering India, Pakistan and Burma. Good conditions, three-year contract with home leave on full pay. Applicants should have previous overseas experience on the operations or commercial side with heavy electrical plant. Reply at once, with full details of career, to Box No. 1703, Electrical Times. (G 137)

POWER STATION OR MARINE ENGINEERS. Applications are invited by The Calcutta Electric Supply Corporation, Limited, for appointment to the posts of SHIFT CHARGE ENGINEERS in Calcutta where the company has three generating stations each over 100 MW capacity. Candidates must either have had responsible operating experience in modern large high-pressure steam generating stations, or alternatively must have had marine experience with high pressure water tube boilers and turbines and must hold a 1st class Board of Trade Engineering Certificate; such candidates without previous power station experience would be required, if selected, to undergo a course of training in the U.K. before proceeding to Calcutta. The appointments are permanent and selected candidates will be required to sign an agreement for three years. The monthly salary is in the scale Rs.900-45-1,035 (efficiency bar), 1,075-50-1,275; plus overseas pay minimum Rs.200 monthly; plus overseas marriage allowance Rs.250 monthly (the present rupee exchange is 1s. 6d.). There are in addition other generous allowances including overseas child allowance and cost of living allowance. In addition free furnished quarters are provided, as is also free medical attention. Liberal leave and passage rules, contributory provident fund, etc. Applications, giving age (about 35 to 40 preferred), details of training, experience, present position held, should be addressed to the Secretary, Calcutta Electric Supply Corpn., Ltd., Victoria House, Vernon Place, Bloomsbury Square, London W.C.1. (G 159)

PRODUCTION Control. SENIOR ASSISTANT required, able to control production planning, scheduling, machine shop loading, assembling and progressing. Experience in light electrical engineering essential. Interesting work, with prospects for the right man. Five day week. Canteen. West London district.—Write, full particulars and salary required to: Box No. 1691, Electrical Times. (G 110)

REPRESENTATIVE, age 25-30 years approx., required for the Nottingham area, covering products relating to the electricity supply industry. Technical training should be to a minimum of national Certificate, and preference will be given to candidates with local knowledge and connections. Permanent position with superannuation scheme. Salary according to age, experience and qualifications.—Applications, in writing, to the Staff Officer, British Insulated Callender's Cables, Ltd., Prescot, Lancs. (G 113)

SALES REPRESENTATIVE required for Scotland and North England to handle electrical insulating materials, synthetic resin, laminated products and fabrications. Working on a commission basis.—Apply in writing to Box No. 1709, Electrical Times. (G 140)

SENIOR WORK STUDY OFFICER, to supervise team in applying incentives to electrical engineering maintenance workers. Applications are invited from electrical engineers with rate-fixing experience, particularly of manual operations, and good knowledge of time and motion study, supported by practical workshop experience and technical education, preferably to Higher National Certificate standard. Write, stating age, experience and salary desired, to Staff Officer, Imperial Chemical Industries, Ltd., Metals Division, Witton, Birmingham 6. (G 142)

SURVEYORS, experienced in the surveying and profiling of wood pole transmission and distribution lines; must hold current driving licence.—Write, giving age and full details of experience, to Box No. 1707, Electrical Times. (G 139)

TRANSFORMER DRAUGHTSMAN. An experienced Senior Draughtsman urgently required, capable of handling work up to 5,000 kVA.—Applications, stating age, experience, training, and salary required, should be addressed to Employment and Welfare Manager, Johnson and Phillips, Ltd., Victoria Works, Charlton, London S.E.7. (G 42)

THE Brush Electrical Engineering Co., Ltd., Loughborough, require additional SENIOR TRANSFORMER DRAUGHTSMEN for their drawing office extension. Preference will be given to men having experience of the layout of large transformers. A number of vacancies also exists for JUNIOR TRANSFORMER DRAUGHTSMEN and applications are invited from keen men desirous of obtaining progressive positions. In both instances applicants should write, giving full details of experience, age, etc., to the Technical Director. (G 76)

THE Overseas Division of Crompton Parkinson, Ltd., require a COMMERCIAL ENGINEER to handle enquiries for switchgear and transformers, including complete substation contracts involving all classes of gear up to 132 kV. Previous experience of estimating would be an advantage, as would some knowledge of French, Spanish and Portuguese, but the work required is primarily of a co-ordinating nature between overseas agents and customers, and the Company's transformer and switchgear works in this country. Salary will be commensurate with the applicant's experience and qualifications for the post. Please send full particulars of education, training and experience to Reference J.H.F./P., Crompton House, Aldwych W.C.2. (G 112)

TO accommodate present expansion, an old-established engineering company invites applications from established SALES ENGINEERS to fill immediate vacancies in the Midlands, Manchester, and London areas. Preference will be given to men of outstanding personality and experience in the sale of rotating electrical machinery up to 100 h.p. The situations are responsible and progressive, with corresponding remuneration to the right men.—Box No. 1681, Electrical Times. (G 39)

TRANSFORMER DRAUGHTSMEN. Immediate vacancy for Senior with experience up to 100 MVA and Junior with experience up to 5 MVA, also several training vacancies. Yorkshire Electric Transformer Co., Ltd., Empire Works, Dewsbury. (G 114)

TRANSFORMER DRAUGHTSMAN, fully conversant with power transformer construction up to 2,500 kVA, 33 kV, required by a progressive company in South Wales. A house will be available for the successful applicant.—Box No. 1675, Electrical Times. (G 23)

TRANSFORMER ESTIMATOR and Technical Correspondent urgently required. Must be capable of dealing with tenders for home and overseas business; practical experience an advantage.—Applications, stating age, experience, and salary required, should be addressed to Employment and Welfare Manager, Johnson and Phillips, Ltd., Victoria Works Charlton, London S.E.7. (G 43)

YOUNG ENGINEER required for contracts department by manufacturers of electrical instruments and light switchgear. Near London.—Box No. 1689, Electrical Times. (G 87)

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The Board reserves the right to accept all or part of any tender, but does not bind itself to accept the highest or any tender.

JAMES RANKIN,
Secretary.
(G 130)

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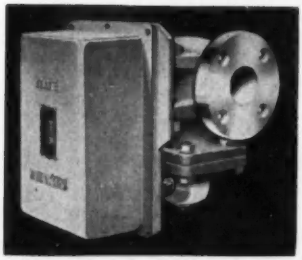

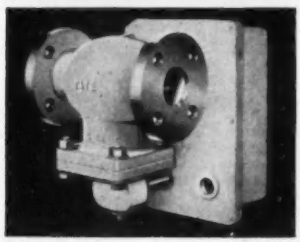

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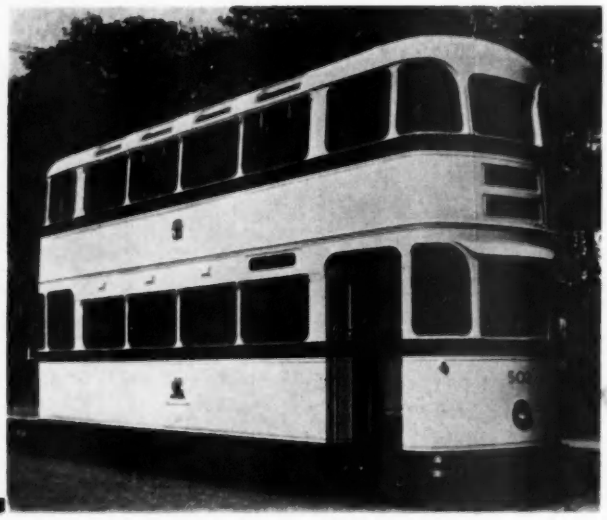

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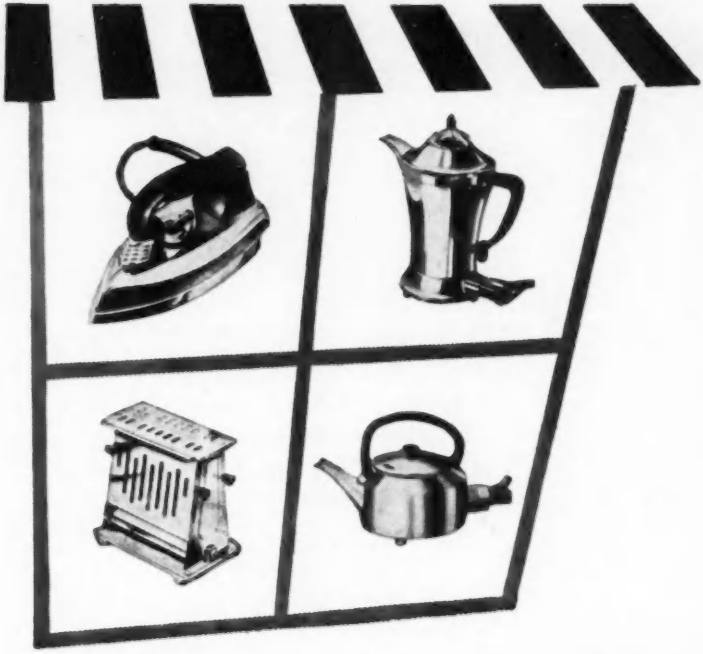

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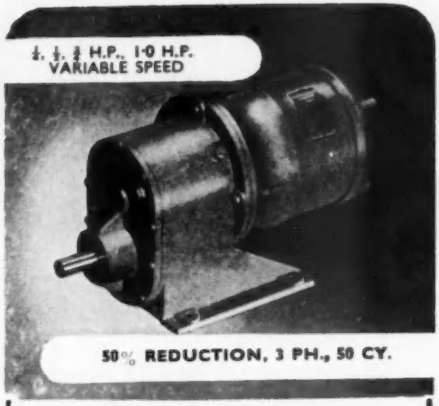

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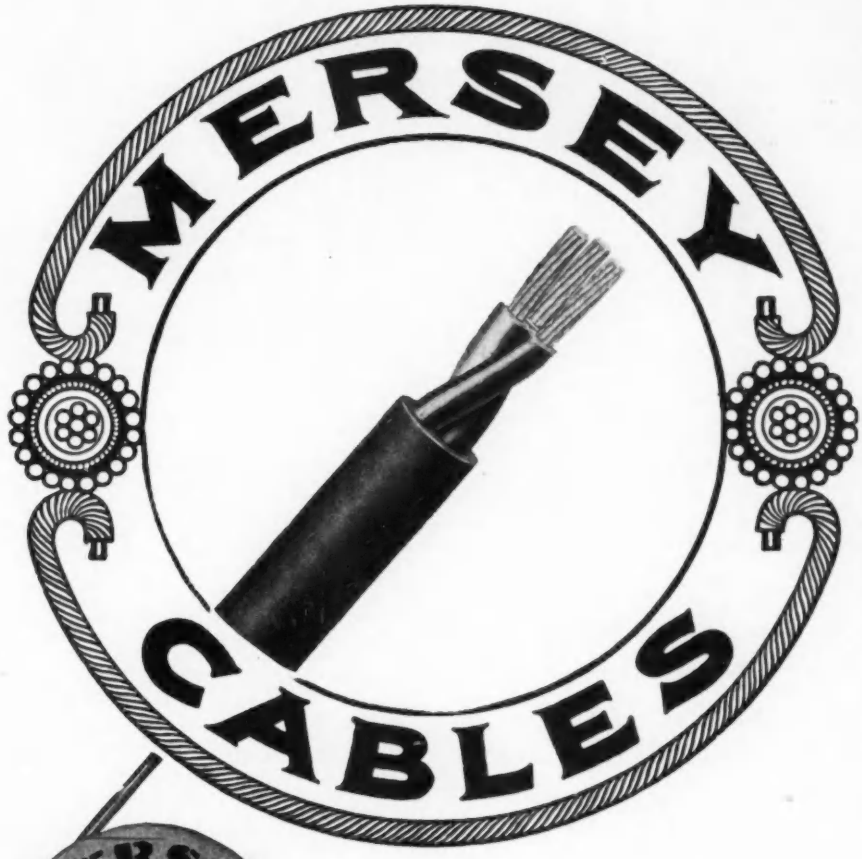

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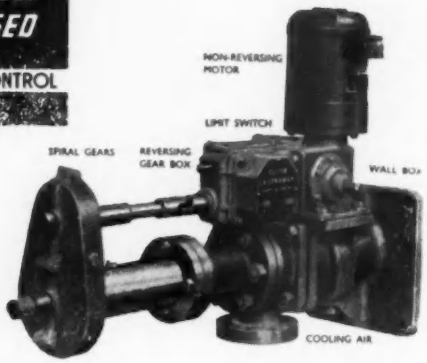

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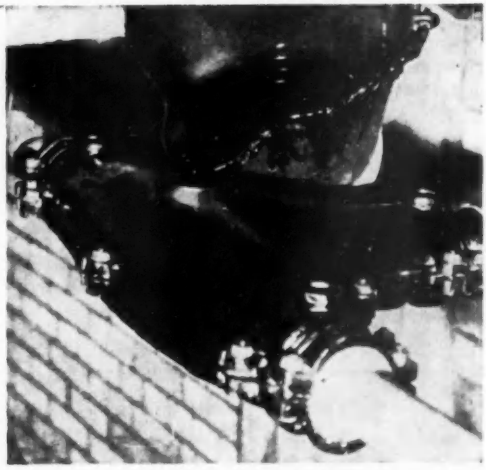

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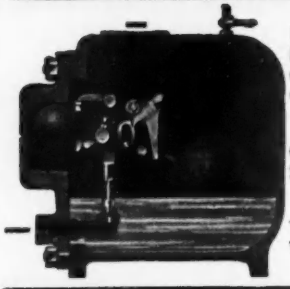

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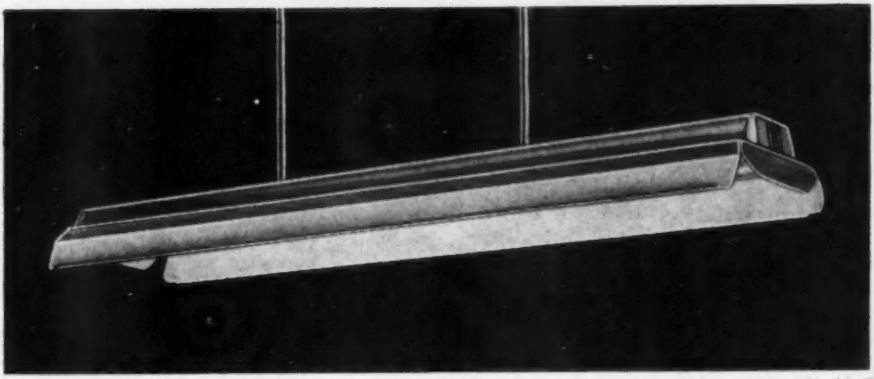

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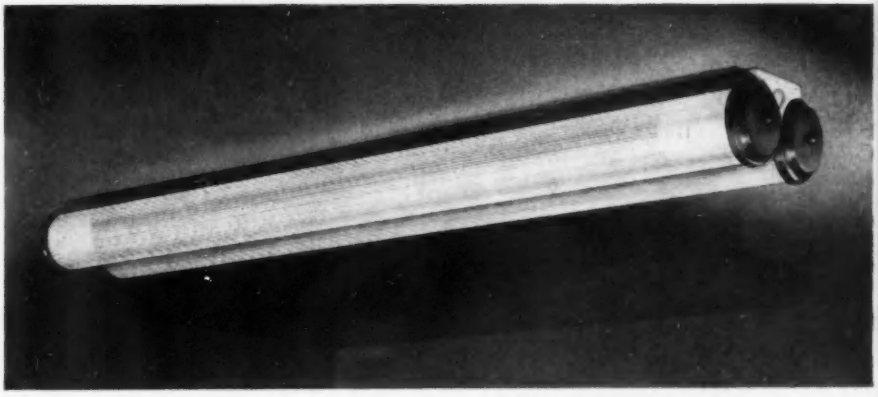

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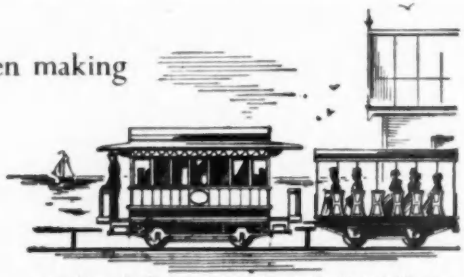

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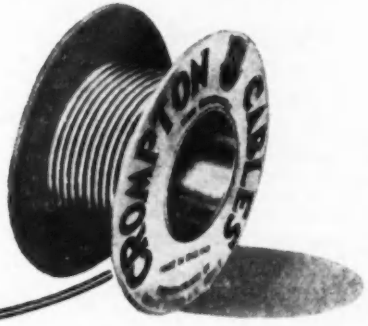

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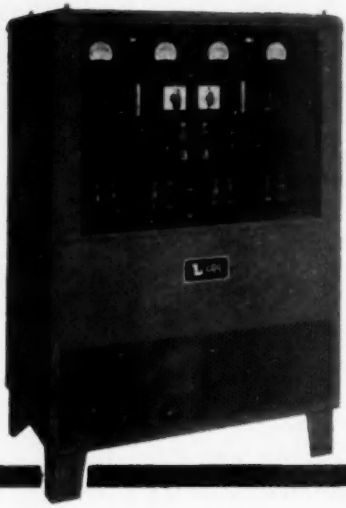

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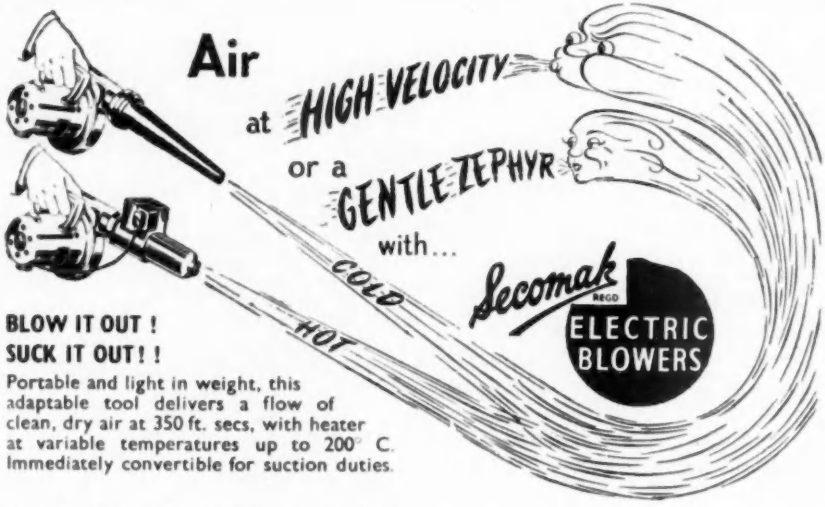

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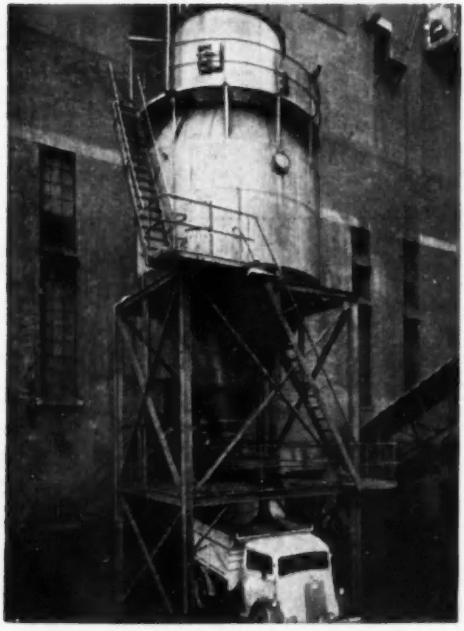

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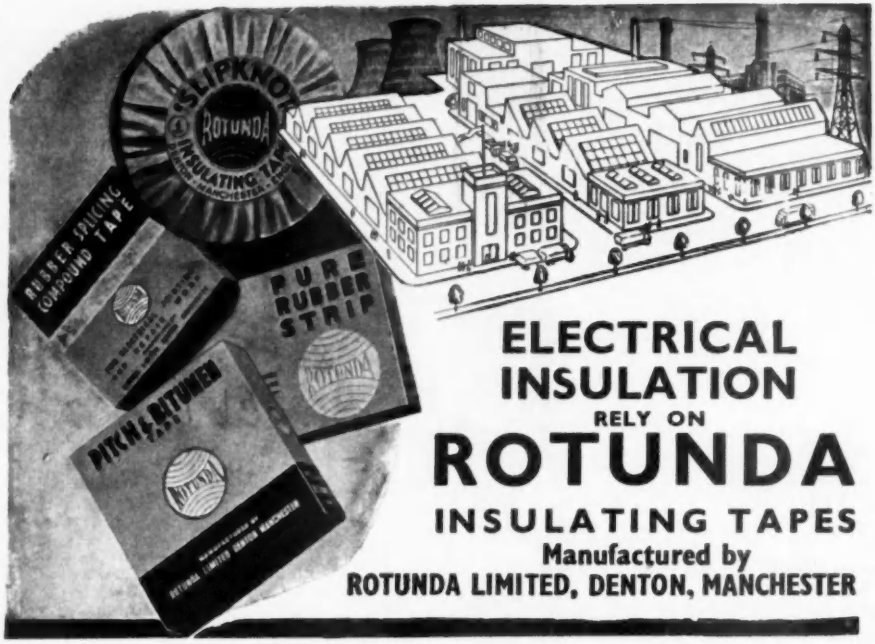

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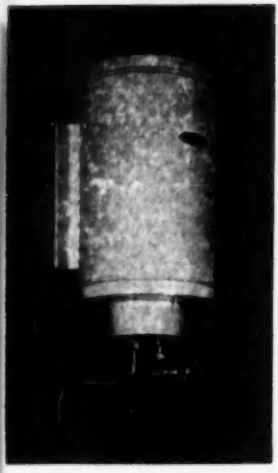

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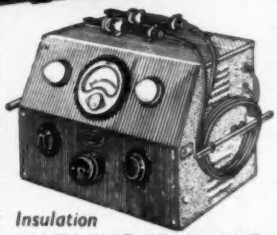

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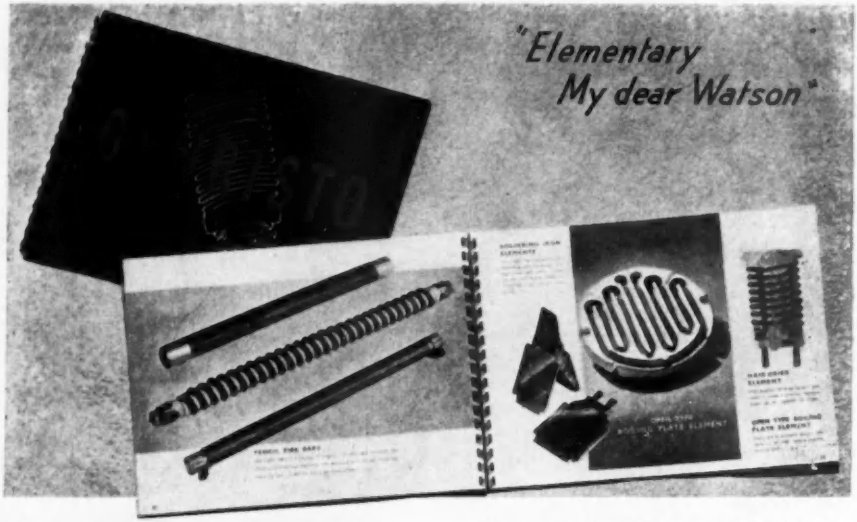

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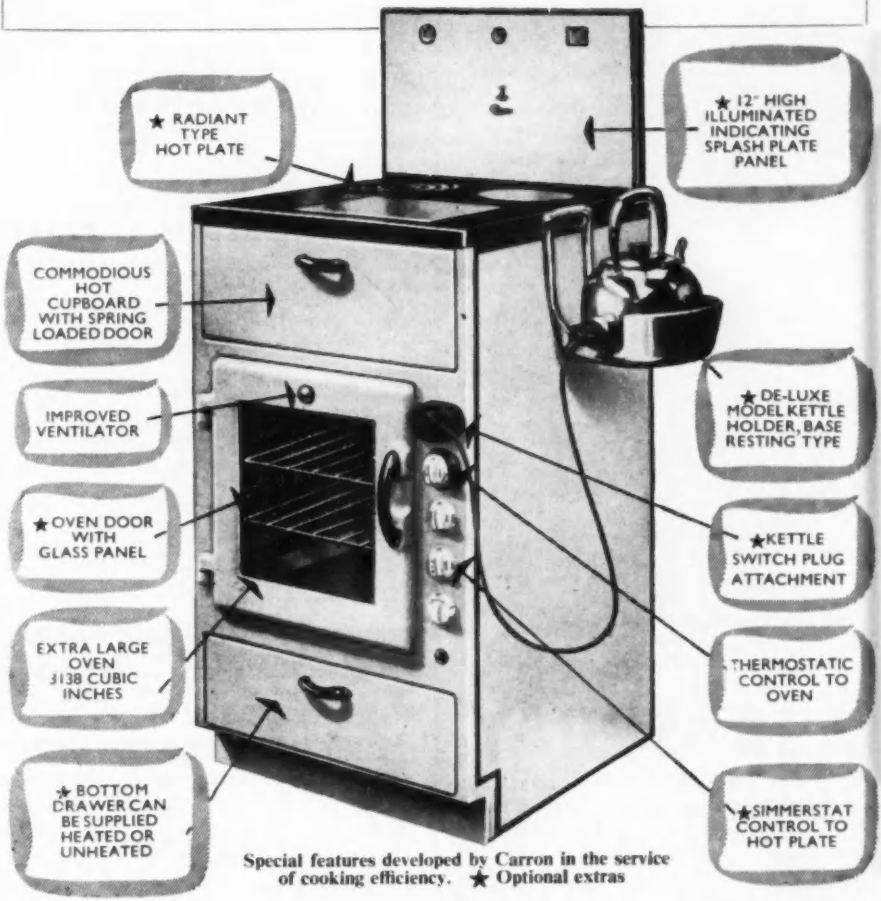
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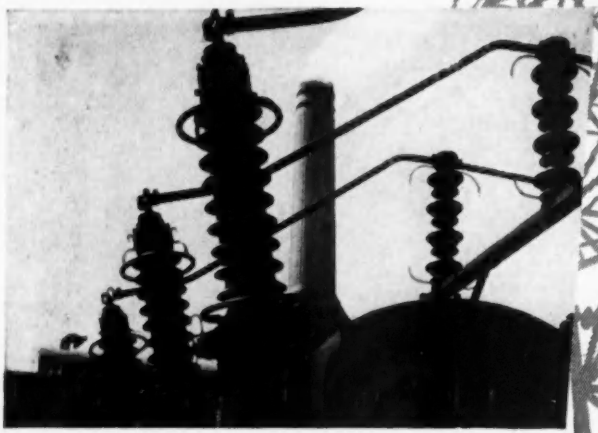

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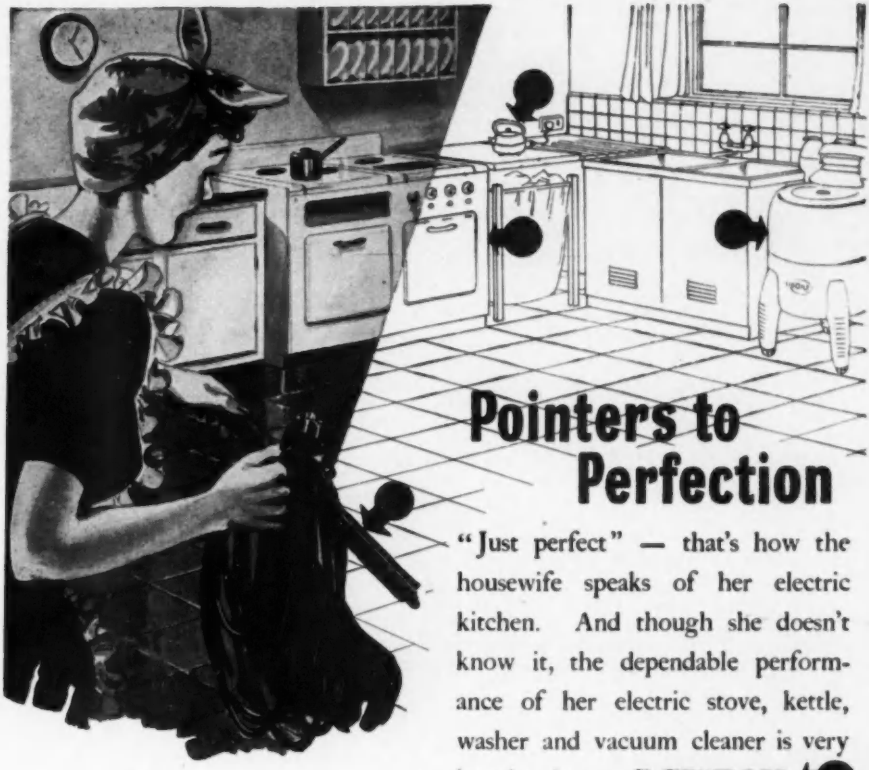

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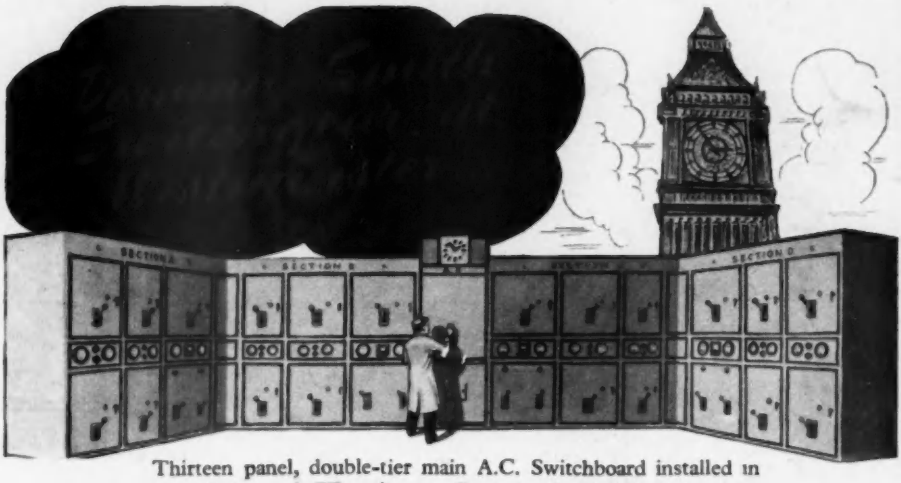

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